

ENVIRONMENTAL, SOCIAL AND CORPORATE GOVERNANCE REPORTING: PERSPECTIVES FROM THE JOHANNESBURG STOCK EXCHANGE AND AN INTERNATIONAL METALS AND MINING SAMPLE

by

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Declaration

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S.L. Mitchell

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ABSTRACT

Global interest in responsible investing has grown in recent years. To make effective decisions, responsible investors require listed companies to report on financial and non-financial performance, giving particular attention to environmental, social and corporate governance (ESG) considerations. This study was undertaken to address the paucity of academic research on ESG reporting in South Africa. A number of local studies had focused on environmental and governance reporting, but no studies had taken a holistic view of ESG reporting. Nor had any studies focused on the metals and mining industry in particular. This is a very important industry from an economic and ESG perspective, both in South Africa and internationally.

The primary objective of this study was two-fold. Firstly, it was to investigate the extent of ESG reporting (both in South Africa and in a sample of international Metals and Mining companies). The second objective was to evaluate the factors that could potentially influence ESG reporting in these two samples.

A positivistic research methodology was adopted as this approach allowed the researcher to test the stated research hypotheses. Quantitative secondary data were thus collected and analysed. The data collection process consisted of three phases: the first phase involved an extensive literature review of the key constructs; the second phase dealt with the collection of data for the dependent variable (Overall ESG score) from MSCI ESG Research's database; and the third phase entailed collecting data for the 12 independent variables from Bureau van Dijk and selected websites.

MSCI ESG Research's universe was used to establish the two samples used in this study. The JSE sample consisted of 110 listed companies, whereas the international Metals and Mining sample consisted of 173 companies. Because MSCI ESG Research had completed only one year of ESG research when this study commenced, only data for 2012 were available. Descriptive and inferential statistics were completed to analyse the data.

The empirical findings of the JSE sample show that the Governance pillar mean score was significantly higher than the Social pillar mean score and the Environmental pillar mean score. ESG reporting was found to be positively associated with companies which were included in the Nedbank Green Index. Companies included in the JSE Socially Responsible

Index produced significantly better ESG reports than those excluded from the index. Significant differences were also noted in the Overall ESG score based on the nature of the industry in which a company operated.

In the international Metals and Mining sample, two statistically significant relationships were found: larger companies had higher ESG score than smaller companies; and the greater the ownership concentration in a company, the better the ESG reporting on average. Four statistically significant differences were observed. Companies included in the FTSE4Good Index Series had better ESG scores than companies excluded from the index. Companies in developed countries had better ESG reporting than companies in emerging markets. The third difference related to companies which used the Global Reporting Initiative's guidelines. These companies had higher Overall ESG scores than those which did not use the guidelines. The same applies to companies which were participants of the UN Global Compact and those who were not.

It was concluded that investors who favour sound ESG reporting (and hence ESG management) should ideally focus on larger companies, those which are included in an responsible investing index, use the Global Reporting Initiative's guidelines, and are participants of the UN Global Compact. Listed companies, particularly those in the Metals and Mining industry, should give more attention to environmental and social considerations, to the overall quality of their ESG reports, and should make more use of available initiatives to aid non-financial reporting.

KEYWORDS

Environmental, social and corporate governance (ESG) considerations; ESG Reporting; Integrated reporting; Responsible indices; Global Reporting Initiative; United Nations Global Compact; King Reports; JSE; International Metals and Mining industry.

OPSOMMING

Die afgelope jare het belangstelling in verantwoordelike beleggings wêreldwyd toegeneem. Ten einde verantwoordelike beleggers in staat te stel om doeltreffende besluite te neem, moet genoteerde maatskappye oor hul finansiële én nie-finansiële prestasie verslag doen, met bepaalde klem op omgewings-, maatskaplike en korporatiewe beheer (OMB) kwessies. Hierdie studie is onderneem om 'n leemte in akademiese navorsing oor verslagdoening in Suid-Afrika te vul. 'n Aantal plaaslike studies het al op omgewings- en beheerverslagdoening gekonsentreer, maar geen navorsing tot dusver het OMB-verslagdoening holisties beskou nie. Ook het geen studies nog die soeklig op die metaal- en mynboubedryf in die besonder gewerp nie. Hierdie is 'n baie belangrike bedryf uit 'n ekonomiese en OMB-oogpunt, in Suid-Afrika sowel as internasionaal.

Die hoofdoelmerk van hierdie studie was tweeledig. Eerstens wou die studie ondersoek instel na die omvang van OMB-verslagdoening (by 'n Suid-Afrikaanse steekproef sowel as 'n steekproef van internasionale metaal- en mynboumaatskappye). Tweedens wou die navorsing die faktore bepaal wat 'n moontlike invloed op die OMB-verslagdoening van hierdie twee steekproewe kan hê.

'n Positivistiese navorsingsmetodologie is gebruik, aangesien hierdie benadering die navorser in staat gestel het om die navorsingshipoteses te toets. Kwantitatiewe sekondêre data was dus ingesamel en ontleed. Die data-insamelingsproses het uit drie fases bestaan: In die eerste fase was 'n omvattende literatuurstudie oor die hoofkonstrukte onderneem; die tweede fase het uit data-insameling oor die afhanklike veranderlike (algehele OMB-telling) uit die databasis van MSCI ESG Research bestaan, terwyl die derde fase data-insameling oor die 12 onafhanklike veranderlikes uit Bureau van Dijk en op uitgesoekte webtuistes behels het.

Die universum van MSCI ESG Research is gebruik om die twee steekproewe in hierdie studie te bepaal. Die Suid-Afrikaanse steekproef het uit 110 genoteerde maatskappye bestaan, terwyl die steekproef van internasionale metaal- en mynboumaatskappye 173 entiteite ingesluit het. Aangesien MSCI ESG Research met die aanvang van hierdie studie nog net een jaar van OMB-navorsing onderneem het, was data slegs vir 2012 beskikbaar. Beskrywende en inferensiële statistieke is ontwikkel om die data te ontleed.

Die empiriese bevindinge van die Suid-Afrikaanse-steekproef lewer 'n beduidend hoër gemiddelde telling vir beheerverslagdoening as vir maatskaplike en omgewingsverslagdoening op. OMB-verslagdoening blyk 'n positiewe korrelasie te toon met maatskappye wat by Nedbank se groen-indeks ingesluit is. Maatskappye wat ingesluit was in die Johannesburg Effektebeurs se indeks vir maatskaplike verantwoordelikheid het op hulle beurt aansienlik beter OMB-verslae opgestel as dié buite die indeks. Beduidende verskille in algehele OMB-tellings is ook opgemerk op grond van die aard van die bedryf waarin 'n maatskappy funksioneer.

In die internasionale metaal- en mynbousteekproef is twee statisties beduidende verwantskappe aangetref: Groter maatskappye het 'n hoër OMB-telling as kleiner maatskappye getoon, en hoe hoër die eienaarskapskonsentrasie in 'n maatskappy, hoe beter die OMB-verslagdoening oor die algemeen. Vier statisties beduidende verskille is boonop waargeneem. Maatskappye wat deel was van die FTSE4Good-indeksreeks het beter OMB-tellings opgelewer as maatskappye buite die indeks, en maatskappye in ontwikkelde lande het beter gevaar met OMB-verslagdoening as dié in ontluikende markte. Die derde verskil hou verband met maatskappye wat die riglyne van die Globale Verslagdoeningsinisiatief (GRI) volg, wat algeheel hoër OMB-tellings gehad het as diegene wat nie die riglyne gebruik nie. Dieselfde geld vir maatskappye wat aan die Verenigde Nasies (VN) se wêreldverdrag ("Global Compact") deelneem en diegene wat nie deelneem nie.

Die gevolgtrekking word gemaak dat beleggers wat goeie OMB-verslagdoening (en dus goeie OMB-bestuur) verkies, behoort te konsentreer op groter maatskappye, maatskappye wat by 'n indeks vir verantwoordelike belegging ingesluit is, wat die riglyne van die Internasionale Verslagdoeningsinisiatief volg, en wat aan die VN se wêreldverdrag deelneem. Genoteerde maatskappye, veral dié in die metaal- en mynboubedryf, behoort ook meer aandag te skenk aan omgewings- en maatskaplike sake sowel as die algehele gehalte van hul verslae, en behoort meer gebruik te maak van beskikbare inisiatiewe om nie-finansiële verslagdoening te ondersteun.

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LIST OF ACRONYMS

ACWI	–	All Country World Index
B-BBEE	–	Broad Based Black Economic Empowerment
BRICS	–	Brazil, Russia, India, China and South Africa
CDP	–	Carbon Disclosure Project
CFP	–	Corporate financial performance
CSP	–	Corporate social performance
CSR	–	Corporate social responsibility
DJSI	–	Dow Jones Sustainability Index
DSI400	–	Domini 400 Social Index
EPS	–	Earnings per share
ESG	–	Environmental, social and corporate governance
FTSE	–	Financial Times Stock Exchange
GDP	–	Gross Domestic Product
GNI	–	Gross National Income
GNP	–	Gross National Product
GRI	–	Global Reporting Initiative
HPR	–	Holding period return
IIRC	–	Integrated Reporting Council
ISE	–	Corporate Sustainability Index
IVA	–	Intangible Value Assessment
JSE	–	Johannesburg Stock Exchange
KLD	–	Kinder, Lydenberg, Domini & Company
M/B	–	Market value to book value
NEDs	–	Non-executive directors
RI	–	Responsible investing
ROA	–	Return on assets
ROE	–	Return on equity
SRI	–	Socially Responsible Investment
UN	–	United Nations
UNPRI	–	United Nations Principles for Responsible Investments
USA	–	United States of America

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

In this chapter the background to the study, the problem statement, research objectives and research questions will be provided. The research design and methodology for this study will then be presented. After considering whether or not any prior academic research has been conducted on this topic, the study's contribution, and ethical consideration will be discussed. The chapter will conclude with an orientation of the study.

1.2 BACKGROUND TO THE STUDY

The phenomenon of responsible investing (RI) is growing globally at an unprecedented pace (2012 Global Sustainable Investment Review, 2012:2). Although no universally accepted definition of RI exists, it essentially refers to the practice of incorporating ethical and environmental, social and corporate governance (ESG) considerations into investment analysis and ownership practices. The roots of RI can be traced back to the 18th century when Quakers in the United States of America (USA) refused to invest in businesses associated with alcohol, the production of weapons and the slave trade (Schueth, 2003:189; Schwartz, 2003:195). Since the anti-South African boycotts of the 1970s and 1980s, the numbers of RI funds and assets under management have increased at a rate far exceeding that of conventional investments (2012 Global Sustainable Investment Review, 2012:3).

To make effective investment decisions, responsible investors require listed companies to report on more than mere financial performance (Hummels & Timmer, 2004:73). In addition to these indicators, companies also need to report on their non-financial performance, giving particular attention to ESG considerations (Vives & Wadhwa, 2012:2; Mănescu, 2011:95; US Social Investment Forum, 2010; Renneboog, Ter Horst & Zhang, 2008:1723). A wide range of ESG considerations are evaluated by responsible investors. According to Sun, Nagata and Onoda (2011:676), the most important considerations deal with companies' actions regarding sustainable development, environmental protection, social good, and human rights.

Marocco (2010:78) urged companies to manage their ESG factors appropriately, as a good proxy for the quality of management is through good management of corporate governance, all stakeholders, and the environment. In this study, ESG reporting will be seen as a proxy for ESG management; as such, mention will not be made to ESG management and reporting, but ESG reporting only.

Although South African investors have been slow to embrace RI, this is set to change in the future (Crotty, 2012; Greenblo, 2012). Recent changes to Regulation 28 of the Pension Funds Act (No. 24 of 1956) oblige local pension funds to include an RI policy as part of their investment policy statement (Cranston, 2012). This development is likely to increase the pressure on companies to improve their ESG reporting. This pressure is likely to come from institutional investors becoming more selective about the companies in which they invest.

ESG reporting refers to the public disclosure of information on a company's ESG policies and practices. Reporting on ESG factors has changed over time, to become more integrated (Vives & Wadhwa, 2012:2). With increased integration of ESG issues into traditional investment analysis, companies across economic sectors are pressured to improve their ESG reporting (Gasperini, Doni & Pavone, 2012:3). ESG disclosure has captured the attention of practitioners and academics alike. Research shows that non-financial reporting previously focused on environmental issues, but has evolved to include social and corporate governance considerations as well (Amran & Haniffa, 2011:143).

Given that mining (or resource) companies comprise a significant portion of the FTSE/JSE All Share Index and make a substantial contribution to local economic growth and employment, investors (both conventional and responsible) have a keen interest in what happens in this industry. According to the Chamber of Mines of South Africa (2012:10), the mining industry created 514 760 direct jobs and 836 623 indirect jobs in 2012. The mining industry's direct contribution to South Africa's gross domestic product (GDP) in 2011 was 8.8 per cent. Other socio-economic contributions by the local mining industry in 2011 were salaries and wages to the value of R87 billion as well as corporate taxes and royalties equal to R25.5 billion and R5.5 billion respectively in 2011 (Chamber of Mines of South Africa, 2012:11; South Africa.info, 2012). The resource industry may be used interchangeably with metals and mining industry in this research.

The mining industry has a poor reputation with regard to ESG considerations. On the environmental front, the industry is destructive because of the extraction process used. Mining companies mainly use coal-generated electricity, and generate a great deal of pollution. Mines face high costs associated with acid mine drainage, rehabilitation costs, water resources and land use issues (Chamber of Mines of South Africa, 2012; Jenkins & Yakovleva, 2006:272; Frick, 2002). Social considerations that influence the profitability (and sustainability) of local mines include labour unrest (such as the Marikana incident in August 2012 and the five month strike in the platinum industry in 2014) and also HIV/AIDS (Kruger, 2014; Shabalala, 2014; Chamber of Mines of South Africa, 2012).

In recognition of the importance of ESG reporting, the International Integrated Reporting Council (IIRC) was established in 2010. According to the Council, an integrated report is “meant to connect non-financial and financial information into one disclosed report”. Integrated reports can provide information to stakeholders that traditional financial reports lack (The IIRC, 2013; Gasperini *et al.*, 2012:1).

On an international level ESG reporting has been and continues to be influenced by international initiatives such as Global Reporting Initiative (GRI), the United Nations Principles for Responsible Investment (UNPRI), the Carbon Disclosure Project (CDP) and international responsible indices. The Dow Jones Sustainability Index series, FTSE4Good Index Series, STOXX Sustainability Indices and the MSCI SRI Index series are such indices (Sun *et al.*, 2011:678).

Vives and Wadhwa (2012:1-2) maintained that responsible investment indices, sometimes referred to as sustainability indices, have generally been created to provide investment benchmarks for investors. RI indices are tools to identify companies that have successfully integrated sustainability into their strategies and operations (Sun *et al.*, 2011:677). A number of studies have investigated companies’ non-financial reporting and the companies’ inclusion in an RI index, such as Johannesburg Stock Exchange Socially Responsible Investment (JSE SRI) Index (Sonnenberg & Hamann, 2006:305), and the FTSE4Good Index Series (Collison, Cobb, Power & Stevenson, 2009:40).

An international study undertaken in 2009 on integrated reporting commended Brazilian and South African companies for having made great strides in ESG reporting (Park & Kowal, 2011:3). Increased RI activity by stock exchanges in emerging markets, such as South Africa

and Brazil, reflects the need for reliable ESG information. In a study by Ernst and Young (2014:8), investors stated that their confidence in the non-financial information reported by companies was higher when they knew that the ESG information was reliable and credible. The integration of ESG considerations into investment decision-making is a key method of promoting improved ESG reporting (Gasperini *et al.*, 2012:11; Park & Kowal, 2011:4).

In response to the recommendation of the third King Code of Governance Principles for South Africa (henceforth called King III), the JSE now requires all listed companies to produce integrated reports (Institute of Directors in Southern Africa, 2013; Johannesburg Stock Exchange, 2013a). JSE-listed companies are specifically required to provide information on their corporate ESG policies and performance and how the company intends to create value for shareholders now and in the future (The IIRC, 2013; Gasperini *et al.*, 2012:1, 3). King III recommends that companies employ the reporting framework provided by the GRI. This framework provides guidelines to companies in terms of what should be reported on and how the reporting should be done (Global Reporting Initiative, 2013a; Park & Kowal, 2011:4).

South Africa, along with other emerging markets, has experienced increased shareholder interest in recent years, in companies' ESG performance. The UNPRI and the CDP have also shifted their attention to emerging markets' ESG performance (United Nations Principles for Responsible Investment, 2013; Carbon Disclosure Project, 2013; Park & Kowal, 2011:2-3).

Standardised ESG reporting is not as simple as might be expected, as ESG factors are predominantly country and sector specific (Marocco, 2010:27; Brammer & Pavelin, 2008:123). ESG issues should not be generalised across countries or sectors, as differences exist. For example, the environmental and social concerns faced by the mining industry would be very different from those faced by the financial industry (Mănescu, 2011:100; Hagart & Knoepfel, 2007:6).

Aside from the factors mentioned above, researchers have examined the effect of a number of other factors believed to influence a company's non-financial reporting. Factors that have been identified in previous studies include company size, financial performance, board composition, and ownership concentration (Baird, Geylani & Roberts, 2012:367; Brammer & Pavelin, 2008:123).

1.3 PROBLEM STATEMENT

Limited academic research has been conducted on ESG reporting in South Africa (Sonnenberg & Hamann, 2006:313), despite the country being a pioneer in integrated reporting. Most early studies in South Africa focused on environmental reporting (Viviers & Boudler, 2010:66; Mitchell & Hill, 2009:52; De Villiers & Van Staden, 2006; Mitchell & Quinn, 2005:17; Antonites & De Villiers, 2003:1; De Villiers, 2003:11; De Villiers & Lubbe, 1998:20; Van Niekerk & Vorster, 1998:319) and corporate governance disclosure (Barac & Moloi, 2010:25; Abdo & Fisher, 2007:43). Companies' reporting on their social policies and performance was not as extensively disclosed as were environmental and governance concerns (Mitchell & Hill, 2009:52; De Villiers, 1999). As far as could be established, no single academic study has focused exclusively on all three elements of ESG reporting in South Africa.

A review of the literature also revealed that very little research had been conducted on ESG reporting in the metals and mining industry. Although this industry makes a positive contribution to job creation and economic development, it has a bad track record in terms of its impact on the natural environment and the people. The environmental risks in the metals and mining industry include pollution-created ones such as acid mine drainage, and the use of large quantities of water. The health and safety risks associated with working in this industry include employees' risk of HIV/AIDS, injury or death. This industry was chosen as it had been stated that companies in high-impact industries, such as this one, should be publishing comprehensive ESG reports for their stakeholders' benefit (Gasperini *et al.*, 2012:30).

In light of the above, the purpose of this study was two-fold. The researcher first set out to investigate the extent of ESG reporting in a sample of JSE-listed companies and a sample of international Metals and Mining companies. Secondly, the factors that could potentially influence ESG reporting were investigated for both samples.

1.4 RESEARCH OBJECTIVES AND QUESTIONS

In this section, the research objectives and research questions formulated from the literature review will be presented.

1.4.1 Primary research objective

In keeping with the problem statement, the primary research objective was two-fold. Firstly, it was to investigate the extent of ESG reporting in South Africa and in a sample of international Metals and Mining companies. Secondly, it was to evaluate the factors that could potentially influence ESG reporting in South Africa and in the international Metals and Mining industry.

1.4.2 Secondary research objectives

To give effect to the primary research objective, the following secondary objectives were formulated:

- To conduct a thorough literature review on the key constructs of the study, namely ESG reporting, RI indices, legal system, country status, industry, GRI, United Nations (UN) Global Compact, financial performance, company size, board composition and ownership concentration.
- To select a suitable research design and methodology for the study.
- To collect and analyse relevant secondary data.
- To provide pertinent conclusions and recommendations derived from the findings of the study.

1.4.3 Research questions

The research questions were divided into two sections, namely those dealing with the JSE sample and those pertaining to the international Metals and Mining sample.

The research questions related to the JSE sample were:

- Which pillar of non-financial reporting (i.e. E, S or G) featured the most prominently in the integrated reports of JSE-listed companies in 2012?
- Which aspects of ESG reporting by JSE-listed companies need more attention?
- Are there statistically significant differences among the three pillars of non-financial reporting for the JSE sample?
- Which factors influenced the extent of ESG reporting of JSE-listed companies in 2012?

The relevant international Metals and Mining sample research questions were:

- Are there statistically significant differences among the three pillars of non-financial reporting in the international Metals and Mining sample?
- What are the main ESG issues that are reported on in the international Metals and Mining sample?
- Which aspects of ESG reporting by international Metals and Mining companies need more attention?
- Does ESG reporting by JSE-listed resource companies differ from that of Metals and Mining companies listed in other emerging and developed markets?
- Which factors influenced the extent of ESG reporting of international Metals and Mining companies in 2012?

1.5 RESEARCH DESIGN AND METHODOLOGY

In this section, the research design, research methodology and method that were adopted in this study will be introduced along with details on the data collection and analysis process.

1.5.1 Research design

Research design is defined as an outline of the methods and processes used in research to obtain desired information, to fulfil the research objectives and answer the research questions of the study (Blumberg, Cooper & Schindler, 2011:57). The selection of the research design assists the researcher in formulating the research methodology. According to Zikmund and Babin (2010:65), there is never one best research design, as research designs are chosen to best suit the goals of the research.

Research can be divided into three types, namely exploratory, descriptive, and casual research (Hair, Money, Samouel & Page, 2007:151). Exploratory research is used when there is very little known about the problem a researcher is investigating. Descriptive research is research which is concerned with finding the *what, where, when, who* and *how* from data to answer the researcher's questions. Lastly, causal research can be made use of when a researcher needs to determine if an event will cause another event, therefore an inference can be reached (Cooper & Schindler, 2011:141-143). For this study, a descriptive research design was chosen. More details on why this study is deemed descriptive are presented in Section 4.2.1.

Once the researcher has clarity on the type of research to be undertaken, he or she should decide on whether a quantitative or qualitative research design should be used. Quantitative research uses numerical measurements and analysis to conduct statistical tests. Qualitative research on the other hand, allows the researcher to make interpretations from market phenomena to answer research objectives; no numerical measurements are employed (Zikmund, Babin, Carr & Griffin, 2013:132-134). The researcher used a quantitative research design in this study.

After a researcher decides on whether quantitative or qualitative research design will be used, the primary or secondary data need to be finalised. Primary research entails the collection of data purely for the purpose of the study, while secondary research is data which already exist and can be collected from a database or alternative source. In secondary research, the data were not initially gathered for the purpose of the researcher's study (Struwig & Stead, 2007:40). In this study, secondary data were used, given the nature of the study.

1.5.2 Research methodology

Two main research methodologies are available to researchers, namely the positivistic and phenomenological approaches. A positivistic research paradigm is a deductive approach which uses quantitative data (Blumberg *et al.*, 2011:17), while a phenomenological methodology is inductive and generally uses qualitative data (Struwig & Stead, 2007:5-6).

According to Trochim (2006), a deductive approach occurs when a researcher moves from a general point towards a specific point; for example, a researcher will begin with a theory regarding a topic, which will lead to constructs and then hypotheses being formulated. The researcher is then able to collect the data to test hypotheses, from which conclusions about the original theory can be made. This approach is often referred to as the "top-down" approach. Inductive approach is the opposite of the deductive approach, in that it begins with specific observations and the researcher moves towards developing conclusions or theories based on the patterns observed through the process.

Positivistic paradigms are often applied when large samples are available and there is more structure to the data collection process. Phenomenological paradigms are usually used when the sample size is relatively small and there tends to be less structure involved with the data collection procedure (Zikmund, Babin, Carr & Griffin, 2010:131-134). Based on the more

detailed argument presented in Section 4.3, the researcher adopted a positivistic research paradigm.

1.5.3 Research methods

Various research methods are found in positivistic and phenomenological research paradigms. Which approach a researcher chooses and what the required data for the study are will influence the research method to be used.

Data collection refers to the procedure of gathering information that is required for the study and is often influenced by the sampling plan (Zikmund *et al.*, 2013:67). The sampling plan calls for the identification of the population first. A population includes people, companies or other relevant respondents to a research study, who have common characteristics that could be included in the study (Blumberg *et al.*, 2011:167). As it is normally impossible to reach a total population, samples are used in research. Samples are defined as a portion of the total population (Struwig & Stead, 2007:109).

Different sampling techniques are available to researchers, namely probability and non-probability. Probability sampling is defined as a method where every unit of the population has a known probability of being selected for a study. Non-probability sampling is a method where the probability of a unit of the population being selected for a study is unknown. Under each broad technique, there are more specific techniques available to researchers (Blumberg *et al.*, 2011:187,192; Struwig & Stead, 2007:111-115).

The samples for this study, the JSE and Metals and Mining sample, were drawn based on companies included in MSCI ESG Research's database, which is created by client demand. The JSE sample consisted of 110 companies, and the Metals and Mining sample comprised 173 companies. A non-probability convenient sample technique was used by MSCI ESG Research, as the researcher used all the companies in the database. Full details on these two samples will be presented in Section 4.4.3.1.

Once the data has been collected, the researcher will edit the raw data. The editing process consists of checking the data for inconsistencies or incompleteness. After the editing of the data, the researcher is able to code the data (Zikmund *et al.*, 2010:463). Data analysis is defined as the process of taking collected data and making it more understandable by applying

statistics to it, so that descriptions or interpretations can be made from it (Blumberg *et al.*, 2011:59). Data collection, coding and data analysis are specific to the type of research paradigm chosen. These concepts are discussed in more detail in Section 4.4 under both positivistic and phenomenological research paradigms.

The next two sections in this chapter will describe the data collection and data analysis methods that were used in this research study and which are elaborated on in Sections 4.4.3 and 4.4.4 respectively.

1.5.4 Data collection

As mentioned previously, the researcher used secondary data. The secondary data collection was completed in three phases. The first phase consisted of an in-depth literature review. Literature on key constructs was collected from academic journals (sourced from Google Scholar and databases such as Scopus and EbscoHost), books, websites (such as MSCI and Ernest & Young) and non-academic magazines. The key constructs in this study were: ESG reporting, RI indices, legal system, country status, industry, GRI, UN Global Compact, financial performance, company size, board composition, and ownership concentration

The second phase involved the collection of ESG data from MSCI ESG Research Inc. which provides a range of products and services, such as the Intangible Value Assessment (IVA). Investors use MSCI ESG Research's products and services to integrate ESG elements into their investment decision-making process. It can also assist investors to discover opportunities and risks about potential investments that conventional research may not discover (MSCI ESG Research, 2013a).

ESG scores of JSE-listed companies as well as all companies in the MSCI Metals and Mining universe were collected. MSCI ESG Research's universe is set to grow as more local and international investors become interested in RI. The sample sizes were discussed earlier. The numerical Overall ESG score represents a company's performance in relation to its sector peers. These ratings are determined by means of an industry analysis to establish the key issues within each sector and an analysis of corporate reports, media sources and reports by governmental and non-governmental organisations. All reports were revised and validated to ensure they are of a consistent quality (MSCI ESG Research, 2013a). The individual ESG criteria evaluated by MSCI ESG Research are shown in Table 1.1.

Table 1.1: ESG criteria evaluated by MSCI ESG Research

Environmental pillar	Social pillar	Governance pillar
Energy efficiency	Labour management	Corruption and instability
Water stress	Supply chain labour standards	Financial system instability
Raw material sourcing	Health and safety	Business ethics fraud
Biodiversity and land use	Human capital development	Anti-competitive practices
Carbon emissions	Product safety and quality	Corporate governance
Product carbon footprint	Chemical safety	
Toxic emissions and waste	Financial product safety	
Packaging material and waste	Privacy and data security	
Electronic waste	Insuring health & demographic risk	
Insuring climate change risk	Controversial sourcing	
Financing environmental impact	Opportunities in nutrition and health	
Opportunities in clean technology	Access to communication	
Opportunities in green building	Access to health care	
Opportunities in renewable energy	Access to finance	
	Responsible investment	

Source: MSCI ESG Research (2013a:6)

A detailed list of the criteria in Table 1.1 can be found in Appendix A. The different criteria evaluated will be linked to a literature review presented in Section 2.2.

The third phase of the data-collection process dealt with the collection of information about the factors that could potentially influence the extent of ESG reporting undertaken by companies. Table 1.2 presents the different factors that were uncovered in the literature.

From Table 1.2 it can be seen that nominal and ratio data were collected. A number of sources were used to collect the data required. Data were collected for only one year because the MSCI ESG Research's universe, which is client driven, had only one year's worth of extensive ESG data for the JSE-listed companies when the study commenced.

Table 1.2: The factors influencing the extent of ESG reporting

Factor	Type of data	Source
Inclusion in the FTSE4Good Index as on 31 Dec 2012	Nominal	FTSE Client Services
Inclusion in the JSE SRI Index as on 31 Dec 2012	Nominal	JSE website
Inclusion in the Nedbank Green Index as on 31 Dec 2012	Nominal	Nedbank Green Index website
Legal system of country of domicile	Nominal	US CIA World Factbook
Country status	Nominal	World Bank classification
BRICS classification	Nominal	World Bank classification
Industry classification	Nominal	JSE website
The use of GRI guidelines as on 31 Dec 2012	Nominal	GRI Sustainability Disclosure Database
UN Global Compact participant as on 31 Dec 2012	Nominal	UN Global Compacts website
Financial performance measures (accounting and market based)	Ratio	Bureau van Dijk database
Company size	Ratio	Bureau van Dijk database
Board composition as on 31 Dec 2012	Ratio	Study by Mans-Kemp and Viviers (2014)
Ownership concentration as on 31 Dec 2012	Ratio	Bureau van Dijk database

1.5.5 Data analysis

There are two broad categories of statistics that can be used for positivistic data analysis, namely descriptive and inferential statistics. In this study, both descriptive and inferential statistics were used to analyse the data collected. The following descriptive statistics were calculated: mean, median, standard deviation, skewness and kurtosis. These descriptive statistics were completed to gain more insight into the data and establish that the data were not normally distributed with some outliers being noticed in the data. The Spearman's rank-order correlation, rank biserial correlation, polyserial correlation and one-way ANOVA inferential statistics were completed. The statistical tests assisted the researcher in testing the hypotheses and answering the research questions.

1.6 PRIOR ACADEMIC RESEARCH ON THE TOPIC

The researcher could not identify any postgraduate studies that had been undertaken on the same topic as this study. There were studies conducted on ESG reporting (for example, those

conducted by Ernst & Young, 2014; Ho, 2013; Murphy & McGrath, 2013; MacLean, 2012), but, none of these were found to have examined as many factors at once which could influence the extent of ESG reporting. Also, none of the studies focused on JSE-listed companies and international Metals and Mining companies in the same study.

1.7 CONTRIBUTION OF THE STUDY

This study's main contribution is to address a gap in the body of knowledge about ESG reporting in South Africa and in the metals and mining industry. As indicated earlier, responsible investors require information about ESG management to make effective decisions. Through the development and testing of a theoretical framework on the factors influencing ESG reporting, the research also sheds light on the extent of ESG reporting among JSE-listed and Metals and Mining companies in South Africa and other countries (both developed and emerging). This study's dependent variable is the Overall ESG score, sourced from MSCI ESG Research. The independent variables are discussed in Chapter Three and presented in the extensive theoretical framework developed.

JSE-listed companies, accountants and integrated reporting consultants benefit from seeing where the gaps in reporting are currently. Those that gain, can encourage listed companies to improve their reporting in ESG areas. Improved ESG reporting across the E, S and G pillars of non-financial reporting could assist both conventional and responsible investors when making investment decisions. Academics who present lectures on reporting methods and standards (like accounting lecturers) could, from the findings in this study, benefit from seeing if and how ESG reporting could improve companies' disclosure to stakeholders. Researchers could also benefit from the findings of this study as they can highlight specific topics which may be worth investigating further in their own research. The specific topics which may interest other researchers will be presented in Chapter Three.

1.8 ETHICAL CONSIDERATIONS

Due to the fact that secondary data from the MSCI ESG Research, Bureau van Dijk and other secondary sources were used, the ethical issues that would normally be present in research studies involving people were not a concern for this specific research.

1.9 ORIENTATION OF THE STUDY

Chapter One: Introduction and background to the study

In this chapter a brief background to the study has been given, followed by the problem statement, research objectives and research questions. The research design and methodology were highlighted. The study's contribution and ethical considerations were also discussed.

Chapter Two: Examining ESG reporting

This first literature chapter will explore the extent of ESG reporting, the historical progress over time, and the different forms of non-financial reports that have been produced historically. The importance of ESG reporting for stakeholders and ESG reporting in the Metals and Mining industry will be discussed. To conclude, the benefits and challenges associated with ESG reporting will be highlighted.

Chapter Three: Factors influencing the extent of ESG reporting by listed companies

In this chapter the researcher will identify possible factors that could influence listed companies' ESG reporting. A company's inclusion in an RI index will be the first factor to be considered. The most prominent RI indices will be examined, namely the Domini 400 Social Index, Dow Jones Sustainability Index series, FTSE4Good Index Series, and the JSE SRI Index. The legal system, country and industry in which a company operates will be investigated. Furthermore, well known initiatives around ESG reporting will be studied, such as the GRI and UN Global Compact. Financial performance, company size, board composition and ownership concentration will also be explored as influencing factors. To conclude this chapter, the research hypotheses will be presented in a table.

Chapter Four: Research design and methodology

The research design, methodology and methods will be theoretically discussed and the chosen methodology and methods for the study will be described. The sampling technique, data collection and data analysis theory will be contextualised to the study. In conclusion reliability, validity and generalisability of this study will be discussed.

Chapter Five: Empirical findings – JSE sample

The fifth chapter presents the descriptive and inferential statistics relevant to the JSE sample. The inferential statistics will be used to test the research hypotheses formulated in Chapter Three. The research questions related to the JSE sample will also be answered in this chapter.

Chapter Six: Empirical findings – International Metals and Mining sample

This chapter comprises the descriptive and inferential statistics related to the international Metals and Mining sample. As in Chapter Five, the inferential statistics will assist the researcher in testing the research hypotheses and answering the research questions.

Chapter Seven: Summary, conclusions and recommendations

In this chapter a summary of the completed research, the conclusions and recommendations made based on the literature and empirical investigation will be presented to conclude this research.

CHAPTER TWO

EXAMINING ESG REPORTING

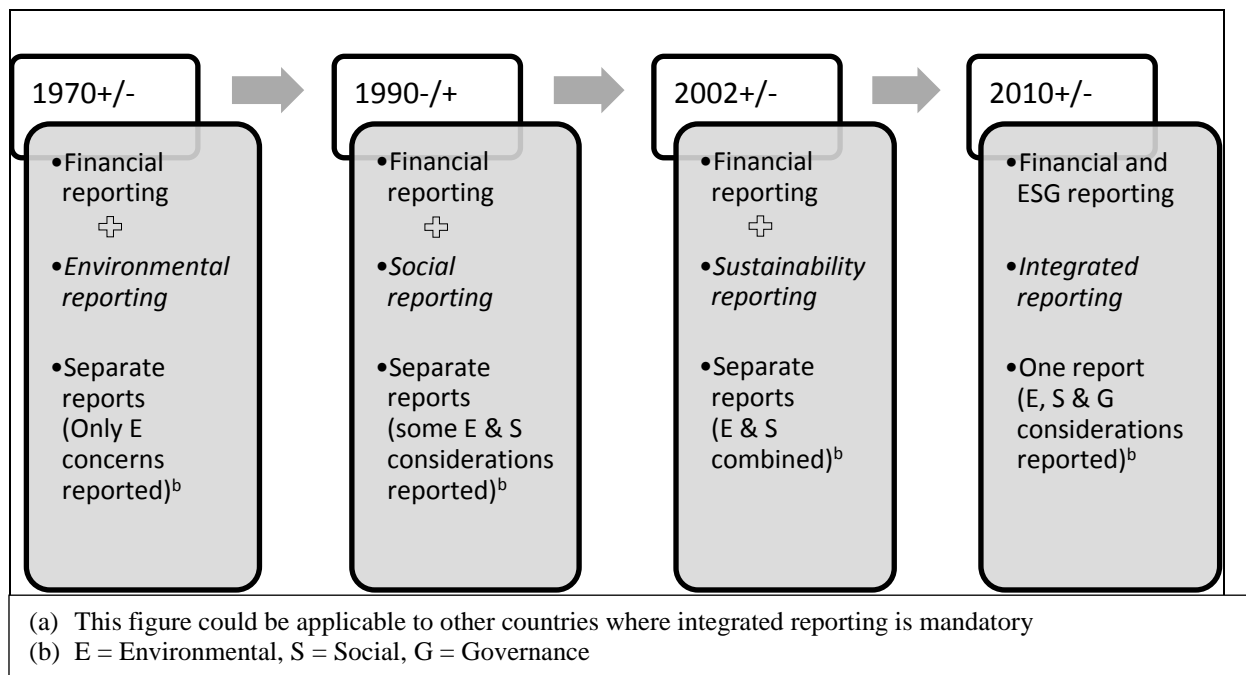
2.1 INTRODUCTION

In the previous chapter a background to the study and pertinent constructs such as integrated reporting and ESG reporting were introduced. Integrated reporting was described as an effective way for companies to provide stakeholders with financial and non-financial information (Gasperini *et al.*, 2012:1). Non-financial information essentially includes ESG concerns. ESG reporting will be studied in greater detail in this chapter as it represents the dependent variable in this study. A discussion of the independent variables will be presented in Chapter Three.

This chapter will begin with a discussion of the different non-financial reports which companies have been publishing over time. Next the importance of ESG reporting for stakeholders will be reviewed. This will be followed by a discussion on ESG reporting in the global metals and mining industry. The benefits and challenges of ESG reporting will be the last two sections of this chapter.

2.2 FORMS OF COMPANY REPORTING

An overview of what is to be covered in this section of the chapter is provided in the form of a timeline. Figure 2.1 highlights the definitions of the different non-financial reports that companies have published since the 1970s. For each type of non-financial report definitions will be provided. Furthermore, the evolution of company reporting on non-financial issues internationally and in South Africa will be reviewed for each type of non-financial report.

Figure 2.1: Timeline of historical progress of non-financial reporting in South Africa (a)

Source: Researcher's own construct

This section of the chapter will begin with a discussion on environmental reporting which was the first form of non-financial reporting undertaken by companies. This will be followed by social reports and sustainability reports which gradually replaced the previous two types of reports.

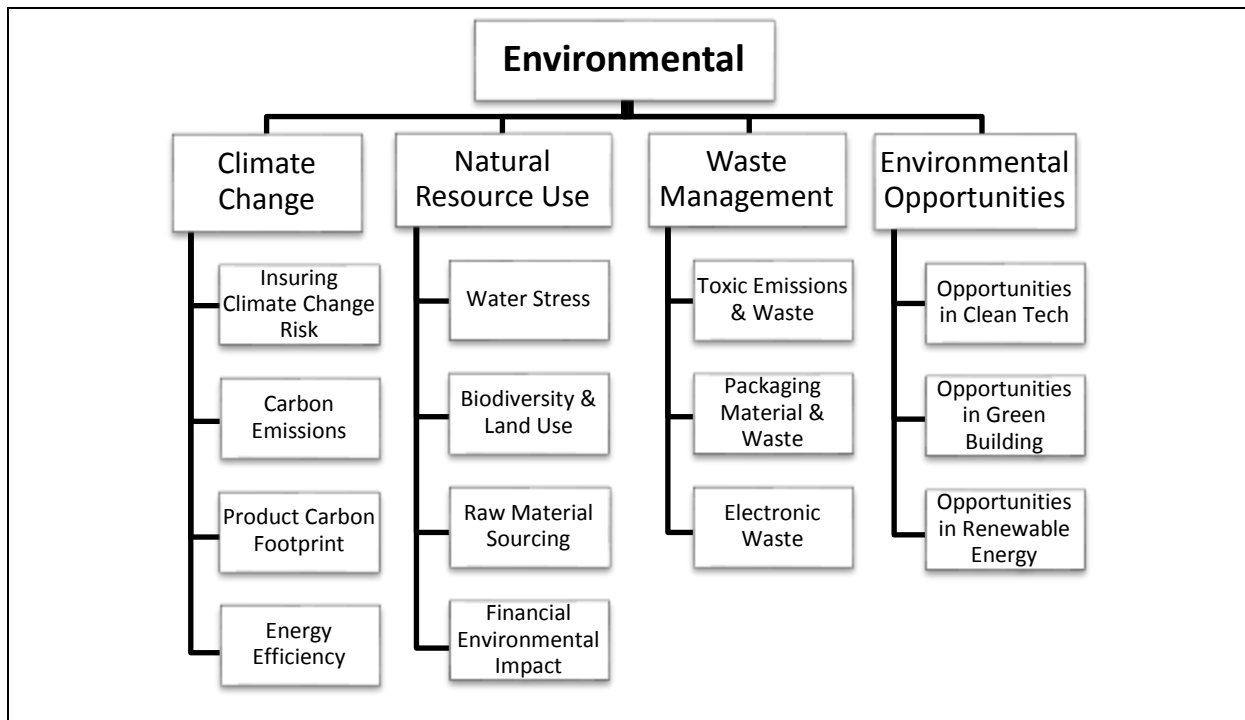
Environmental, social and sustainability reports were separate documents produced by companies. From sustainability reports, companies have moved to publishing one report, an integrated report which includes financial and non-financial information. ESG reporting forms part of integrated reporting and will be discussed as a stand-alone section as the focus of this study.

2.2.1 Environmental reporting

The first types of corporate reports which included non-financial information were environmental reports. Environmental reporting can be defined as the disclosure of environmental issues which specifically influence the company. When environmental reports were being published as stand-alone reports, there were no standards in place to ensure that different companies' environmental reports were comparable (Beets & Souther, 1999:129).

MSCI ESG Research has identified four themes under environmental considerations, for their research in creating IVA reports (Figure 2.2) (MSCI ESG Research, 2013a:16). The themes will be used to highlight typical issues which companies report on in environmental reports.

Figure 2.2: Environmental themes of the IVA model



Source: Adapted from MSCI ESG Research (2013a:16)

The researcher will attempt to link previous studies on environmental reporting with the themes identified in Figure 2.2. Relating to reporting on Climate Change and its sub-themes, Aerts, Cormier and Magnan (2006:303) noted that information regarding a company's capital expenditures on anti-pollution equipment was typically disclosed. According to Jenkins and Yakovleva (2006:273), what was disclosed in environmental reports was given broadly, for instance, environmental protection and natural environment. De Villiers and Barnard (2000:19) reported that mining companies released information regarding their environmental impact and risks during the period 1994 to 1999. Aerts *et al.* (2006:303) stated that disclosure on companies' conformity to emission standards set by government could be found in environmental reports.

Information disclosed concerning Natural Resource Use concerned environmental management, conservation policies and recycling information as identified by Aerts *et al.* (2006:303). Jenkins and Yakovleva (2006:273) mentioned that the use of natural resources by

companies was disclosed in environmental reports. They did not, however, elaborate on the extent of disclosure on the use of natural resources. De Villiers and Barnard (2000:19) noticed that mining companies disclosed their environmental rehabilitation accounting policies each year in environmental reports. Previous researchers provided very little detail regarding what was disclosed in the environmental reports that were analysed. Researchers only drew attention to the main points being reported on.

Environmental issues have often been disclosed as part of companies' annual reports or in separate environmental reports (Jenkins & Yakovleva, 2006:282; Halme & Huse, 1997:138). Separate environmental reports have been found to be useful to stakeholders because these reports provide more detailed information than was possible with annual reports (Antonites & De Villiers, 2003:7; De Villiers & Lubbe, 1998:29).

Interestingly, however, De Villiers and Van Staden (2010:444) found that shareholders preferred environmental information to be published in a section of the company annual report rather than a separate report. The reason behind this was that shareholders felt that the separate reports would be available on a company's website, and it was therefore unnecessary to publish the reports separately.

According to Halme and Huse (1997:137), as the concerns by consumers and investors in the natural environment increased, so did the need for companies to produce environmental reports. The need for environmental reports arose as policies and strategies were perceived by stakeholders to be inadequate (Wilmschurst & Frost, 2000:10). The information found in environmental reports was said to demonstrate to stakeholders that companies were aware, and were taking action regarding environmental concerns (Halme & Huse, 1997:139).

De Villiers and Lubbe (1998:25) identified a number of international initiatives that were established to promote environmental reporting by companies. Initiatives were undertaken by the United Nations, the Canadian Institute of Chartered Accounts and the Institute of Chartered Accountants in England. They generated specific recommendations for companies in terms of environmental reporting. These initiatives were an attempt to bring about standardisation in environmental reporting and have been considered important steps in the improvement of environmental reports (De Villiers & Lubbe, 1998:25).

Environmental reports were the first kind of non-financial reports published by listed companies in South Africa (Antonites & De Villiers, 2003; De Villiers & Barnard, 2000). De Villiers and Lubbe (1998:20) observed that some companies had a wish to produce environmental reports in the absence of regulations for the benefits they associated with environmental reporting, such as better company image and profits, and to legitimise their business activities. Without guidelines or legislation, environmental reports were produced separately or in annual reports, and therefore they were not standardised (De Villiers & Lubbe, 1998:20).

According to De Villiers and Barnard (2000:15), award schemes by the WWF and KPMG for corporate environmental reporting were an indication of the increasing interest in environmental reports. The trend towards producing more and better-quality environmental reports by South African companies demonstrated that companies were increasingly realising the importance of environmental concerns for companies and their stakeholders, therefore, taking responsibility for the issues (Mitchell & Quinn, 2005:20; Wingard & Vorster, 2001:314).

A study by Antonites and De Villiers (2003) was built on the findings of De Villiers and Barnard's (2000) study conducted from 1994 to 1999. Antonites and De Villiers (2003:5) found that over the period 1998 to 2001 there was a decrease in environmental reporting by South African companies. Mining companies' environmental reporting was compared to that of industrial companies, and it was seen that there was an increase in disclosure by mining companies over this period 1998 to 2001.

Antonites and De Villiers (2003:8) suggested that some reasons for the decrease in environmental reporting were due to the lack of legal requirements regarding environmental reports. Researchers, like Mitchell and Hill (2009:57), Antonites and De Villiers (2003:8) and De Villiers and Lubbe (1998:20) similarly illustrated that the lack of a guiding legal system challenged the quality and effectiveness of environmental reports.

Mitchell and Hill (2009:57) identified additional reasons for non-disclosure of environmental reports by South African companies. Reasons were that companies did not feel the pressure or importance, and lacked the resources to produce environmental reports. Environmental reporting has changed over time to include social issues, and the name has changed to social reporting.

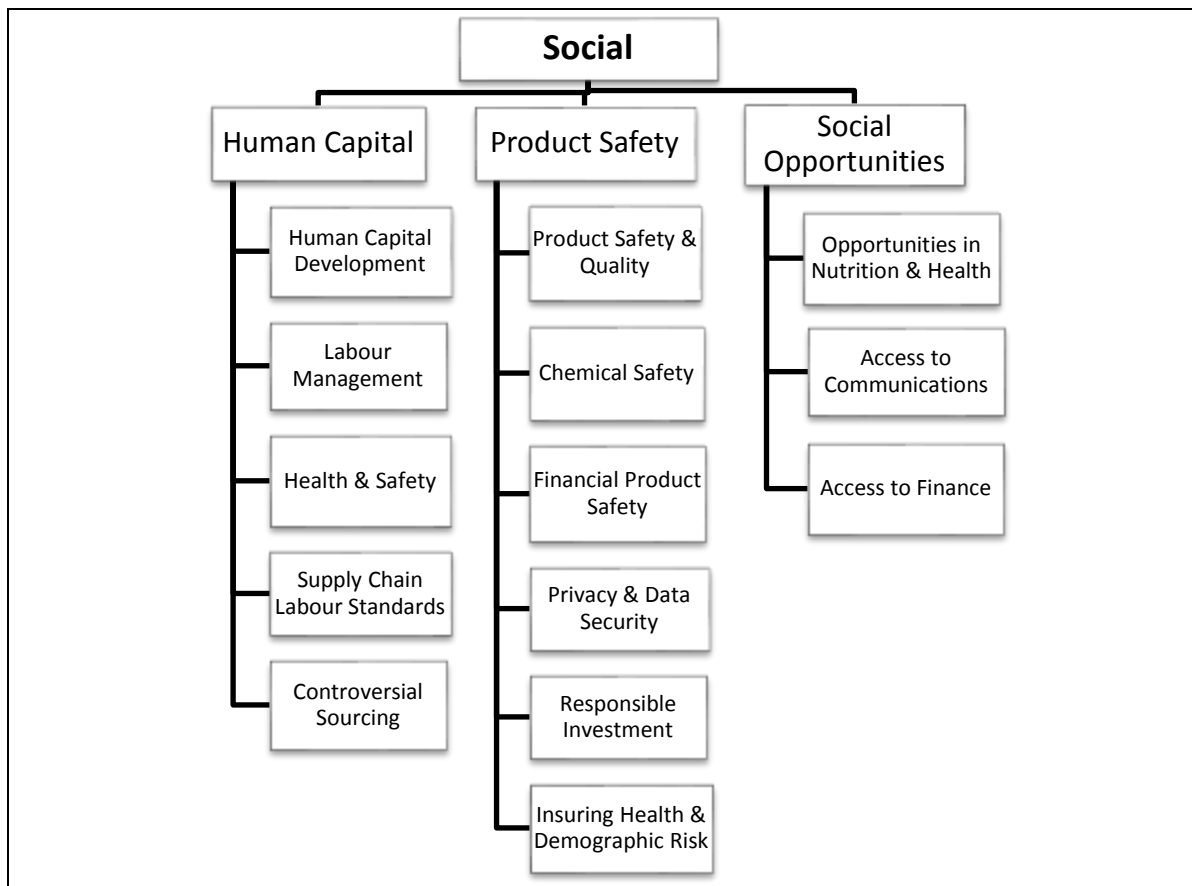
2.2.2 Social reporting

From environmental reports, companies began slowly publishing social reports. The researcher has noted that in some studies on environmental reporting the authors (such as Wilmshurst & Frost, 2000:10; Gray, Kouhy & Lavers, 1995:59) used environmental reporting synonymously with social reporting. This was interesting considering that in this study and another which examined ESG reporting (Murphy & McGrath, 2013:216), social and environmental reporting were defined as separate forms of reporting. Another interesting aspect that the researcher noted was that, as reporting moved from purely environmental to social reporting, the practice of environmental disclosure did not fall away, and companies continued reporting on environmental concerns.

Social reporting as a separate report will be the topic of discussion in this section. According to Gray *et al.* (1995:53), social reports were a form of communication between stakeholders and companies about their social concerns. This was to ensure that a positive relationship between a company and its stakeholders could be maintained. Figure 2.3 depicts specific social considerations identified by MSCI ESG Research used in their IVA model. The researcher will link the themes identified in Figure 2.3 to items stated in literature to be disclosed.

In terms of Human Capital, Gray *et al.* (1995:56, 63) concluded that companies in the UK had the tendency to disclose information relating to employees, such as pensions, share-ownership schemes, number of employees and training opportunities for employees. Jenkins and Yakovleva (2006:273) concurred with Gray *et al.*, (1995) in that social reports mostly included information regarding employees.

Specifically in the area of Human Capital, there had been an increase in health and safety disclosure as stated by Gray *et al.* (1995:65). The increase was caused mostly because of the loss of life in publicly known accidents. Sonnenberg and Hamann (2006:315) established that social reports by South African companies were specific to the country's economic and business environment, in terms of providing information on issues such as Broad Based Black Economic Empowerment (B-BBEE) and employment equity, in addition to the commonly discussed concerns such as HIV/AIDS.

Figure 2.3: Social themes of the IVA model

Source: Adapted from MSCI ESG Research (2013a:16)

Mitchell and Hill (2009:52) examined South African companies' reports and likewise found that in social reports there was generally disclosure regarding a company's policies and procedures for HIV/AIDS (Sonnenberg & Hamann, 2006:315). They added that other health systems in place were disclosed besides the health and safety information that was required by law.

Product Safety was found to include the disclosure of companies' commitment to produce products and provide services which were in the best interest of the consumer (Gray *et al.*, 1995:57). Companies aimed at ensuring transparent communication to consumers regarding the quality, safety and environmental impact of their products and services. It was also established, however, that the reporting on how companies' protected consumers' privacy, beyond compliance with the laws, was not evident in social reports (Perrini, 2006:85).

Information disclosed concerning Social Opportunities included community involvement and social investment policies (Jenkins & Yakovleva, 2006:279; Gray *et al.*, 1995:59). Similarly

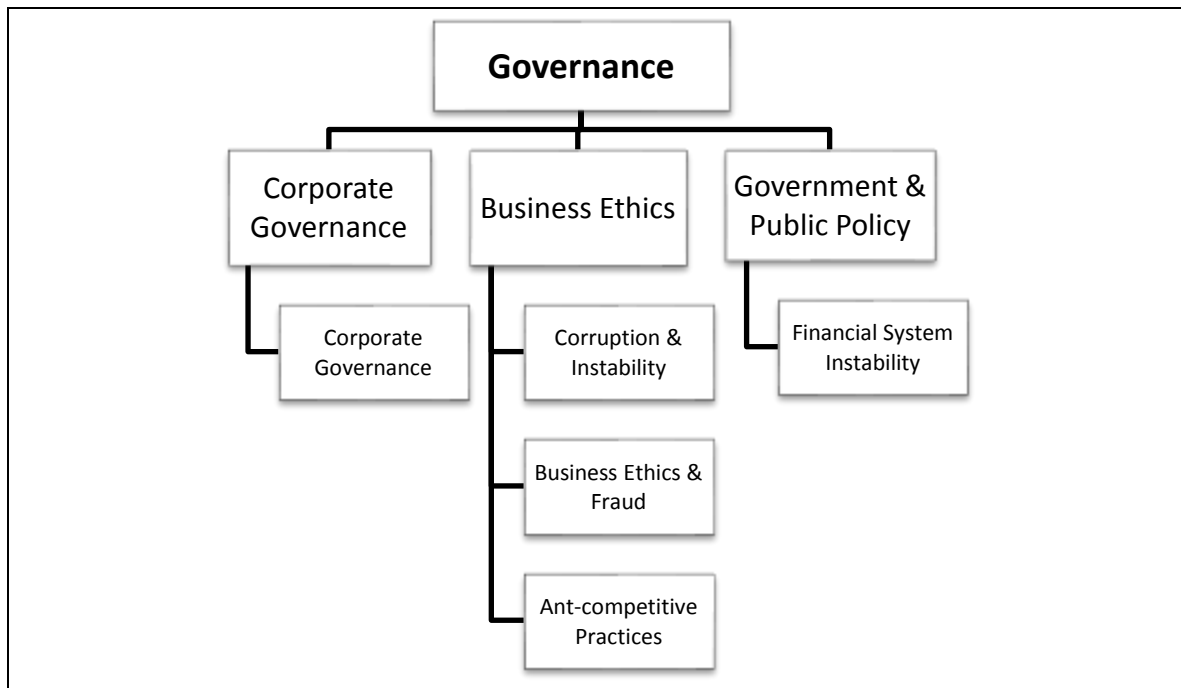
with environmental reports, researchers simply highlighted the main points found in social reports, without going into detail regarding the disclosure. The researcher surmised that more reporting on environmental considerations seems to have been disclosed in company environmental reports than in social reports.

2.2.3 Sustainability reporting

Sustainability reporting is yet another form of non-financial reporting. It refers to the combination of environmental and social reports, which has evolved over the years. Sustainability reporting has been defined as the process of reporting on environmental, economic and social information in a company's practices and policies. It has been said to be synonymous with concepts such as corporate social and environmental reporting and social reporting. All of these concepts are used to describe reporting on non-financial issues for the purpose of informing stakeholders (Amran & Haniffa, 2011:143).

According to Eccles and Saltzman (2011:58), sustainability reports were published because of the inefficiency of financial reports, and to provide more non-financial information to stakeholders. In sustainability reports, information regarding companies' environmental (namely, carbon emissions, energy and water usage), social (for example, employee turnover, workforce diversity and labour practices) and corporate governance (namely, the approach to risk management and the independence of the board of directors) performance was generally disclosed. Eccles and Saltzman's study was a first where all E, S and G considerations were discussed under one name, namely sustainability reporting.

Sonnenberg and Hamann (2006:313) broke sustainability reporting in South Africa down into reporting on corporate governance, environmental, economic and social considerations. Figure 2.4 illustrates the corporate governance considerations identified by MSCI ESG Research for their IVA model.

Figure 2.4: Governance themes of the IVA model

Source: Adapted from MSCI ESG Research (2013a:16)

Only once non-financial reporting changed to sustainability reports, was it noticed by researchers that corporate governance was included in company disclosures (Eccles & Saltzman, 2011:58).

South African companies listed on the JSE are mandated to report on corporate governance issues in accordance with the King III (Institute of Directors in Southern Africa, 2013). However, Sonnenberg and Hamann (2006:313) observed that the level of corporate governance was not adequate to provide stakeholders with enough information for evaluation of a company in terms of its corporate governance risk management. From the Ernst and Young survey, investors were found most likely to reconsider an investment if a company had a history of poor corporate governance, as investors considered corporate governance very important in their investment decision-making process (Ernst & Young, 2014:20).

The King Report II (2002) also highlighted the significance of environmental and social reports as an essential aspect of a company's overall corporate social responsibility (CSR) (Antonites & De Villiers, 2003:2). The King II was specifically developed to emphasise reporting on corporate governance issues as part of a triple bottom line approach to business

(Sonnenberg & Hamann, 2006:311). According to Gstraunthaler (2010:148), King II has been positively accredited for its guidelines on sustainability reporting.

The King II promotes a stakeholder approach and requests companies to “report at least annually on the nature and extent of its social, transformation (including black economic empowerment), ethical, safety, health and environmental management policies and practices” (Hamman & De Cleene, 2005:131). Furthermore, all reports should be produced in accordance with the GRI guidelines.

Sustainability reporting has been identified as a corporate strategy to gain a competitive advantage over competitors and has thus been seen by many stakeholders as the main reason for producing these reports (Amran & Haniffa, 2011:153). As stated by Sonnenberg and Hamann (2006:310), South African companies had been recognised as leaders in producing sustainability reports, as reporting has progressed to systematic reporting and disclosing a range of quantitative information. Until this point, these reports have typically been separate from annual reports. This trend, however, ended with the adoption of integrated reporting.

2.2.4 Integrated reporting

The International Integrated Reporting Council (IIRC) was established in August 2010, as the Council recognised the importance of integrating ESG reporting with financial reporting in a single report called an integrated report (Gasperini *et al.*, 2012:1; Eccles & Saltzman, 2011:57). The IIRC stressed that integrated reporting is not taking the place of financial reporting, but rather demonstrates the evolution of corporate reporting and companies’ responsibility to society (The IIRC, 2013; Frías-Aceituno, Rodríguez-Ariza & García-Sánchez, 2012:46; Park & Kowal, 2011:12).

According to Van Zyl (2013:906), the process of developing an integrated report (as envisioned by King III and the Accounting for Sustainability Project) should take place as follows: first a company should realise what its material sustainability concerns and risks are. Then action plans should be created and business strategies adapted to concentrate on the risks identified. Key performance indicators should be developed, implemented and managed. Finally, the integrated report should be prepared, and it should reflect the company’s challenges and opportunities that it has encountered on its passage to becoming more

sustainable, accountable and responsible. Unfortunately, not all companies follow this process and skip some steps (Van Zyl, 2013:907).

Separate annual financial reports and other non-financial reports, such as environmental reports, social reports and sustainability reports, tend to provide an incomplete view of a company as there are gaps in the information being disclosed. Therefore, integrated reports provide stakeholders with information that traditional financial reports fail to provide (Frías-Aceituno *et al.*, 2012:46; Gasperini *et al.*, 2012:2).

Companies should engage in integrated reporting to be perceived by investors and other stakeholders as being transparent. Companies can use integrated reporting as a means of legitimising their operations. Integrated reporting has the ability to give stakeholders a holistic view of a company (Kocmanova, Nemecek & Docekalova, 2012:661; Jenkins & Yakovleva, 2006:272). When integrated reporting is properly done, Hanks and Gardiner (2012:13) stated that there are a number of benefits that companies can achieve, such as improving the company's reputation, improving performance and strategic decision-making within the company.

Integrated reports have been produced by a few global companies since 2002 (such as Novozymes in 2002, Novo Nordisk in 2004, United Technologies in 2008, followed by other companies like PepsiCo and Southwest Airlines). This was before any committees had considered integrated reporting (Eccles & Saltzman, 2011:58).

Eccles and Saltzman (2011:58) found that there were common reasons amongst the companies for publishing integrated reports ahead of their time. Some of the reasons were that integrated reporting:

- showed commitment to sustainability,
- represented the best means of communication with all stakeholders on how the company is doing, and
- illustrated that a company has a sustainable strategy.

In the most recent version of the JSE Listing Requirements (section 8.63) (Institute of Directors in Southern Africa, 2013:1), it was stipulated that all listed companies should apply the King III and produce an integrated report (Frías-Aceituno *et al.*, 2012:46; Gasperini *et al.*, 2012:7). Eccles and Saltzman (2011:57) stated that integrated reporting being a requirement

for South African companies, is an advancement in building a more “sustainable economic, social and environmental society”.

King III, published in 2009, has played an important role in shaping the nature of integrated reporting in South Africa. Listed companies are required to report on ESG concerns in integrated reports or to explain the reasons for their non-compliance (Institute of Directors in Southern Africa, 2013:1; Gstraunthaler, 2010:148). King III recommended that companies employ the reporting guidelines provided by the GRI. These guidelines provide guidance to listed companies in terms of what should be reported on, and how the reporting should be done (Park & Kowal, 2011:4).

Gasperini *et al.* (2012:11) summarised the main difference between King III and King II as the focus having shifted from reporting (King II) to doing (King III). This essentially means that companies should be ready to put into practice what knowledge it has gained from King II to produce efficient integrated reports.

2.2.5 ESG reporting

As seen in Figure 2.1, ESG reporting is an integral part of integrated reporting, as ESG reporting is essentially non-financial reporting. ESG was defined by Bassen and Kovács (2008:184) as “extra-financial material information about the challenges and performance of a company on ESG concerns”. They stated that additional ESG information when available may assist investors in making better judgements about a company’s risks and opportunities. Therefore, ESG reporting is the concept used to describe corporate reporting on ESG policies and practices (Kocmanova *et al.*, 2012:657; Umlas, 2008:1026).

Murphy and McGrath (2013:218) stated that the term ESG reporting is used to refer to company reporting, which is in addition to financial reporting. The authors noted that ESG reports were sometimes found to be published separately from financial reports. In the South African context, it is, however, generally published as part of the listed company’s integrated report.

Based on the literature review, ESG reporting will be defined in this study as: *the disclosure of non-financial information relating to a company’s environmental and social impact, and corporate governance policies and practices, as well as future endeavours to improve*

situations for stakeholders which feature in a company's annually published integrated report.

The purpose of ESG reporting is to change business practices in an attempt to bring companies closer to environmental and social sustainability (Murphy & McGrath, 2013:222). Warren and Thomsen (2012:7) stated that ESG reporting has the ability to lead to enhanced financial performance through “facilitating a better understanding of the ties between sustainability and economic value and serving as a catalyst for changes in corporate behaviour”. According to Murphy and McGrath (2013:216, 222), ESG reporting has been identified as a means of gaining and retaining the support of stakeholders. Additionally, it has been said that companies can use ESG reporting as a risk-reducing strategy.

In Murphy and McGrath's study (2013:218), there were a number of other published reports which they chose to collectively refer to as ESG reports. These reports were: sustainability reports, GRI reports, corporate social disclosure reports, CSR reports, and triple bottom line reports.

There have been four main initiatives to improve ESG reporting. As previously mentioned these initiatives have been used to create a change to non-financial reporting and integrated reporting. These initiatives are:

- the GRI (Warren & Thomsen, 2012:7; Bassen & Kovács, 2008:184),
- the UN Global Compact (Warren & Thomsen, 2012:7),
- the CDP (Warren & Thomsen, 2012:7) and
- King III in South Africa (Gasparini *et al.*, 2012:7; Ackers, 2009:7).

The evolution of ESG reporting in South Africa (from environmental reports to integrated reports) has been influenced by companies' and professional organisations' need to legitimise their activities (Gstraunthaler, 2010:148). The JSE has been a key role player in ESG reporting, owing to the requirement of integrated reports by listed companies (De Souza Cunha & Samanez, 2012:2). The JSE SRI Index was also noted for its encouragement of South African companies to produce ESG reports (Social Investment Forum, 2009:6).

As mentioned by Park and Kowal (2011:3), South Africa has been commended for companies' progress in ESG reporting disclosure in comparison to companies in other emerging markets. The Social Investment Forum (2009:4) conducted a study on 10 top

companies (based on market capitalisation) in each of the 10 largest emerging markets in the world. South Africa was included in this study to determine ESG reporting trends across the selected emerging markets. The other nine countries were: Brazil, China, India, Indonesia, Israel, Malaysia, Mexico, the Russian Federation and South Korea.

Many South African companies (Social Investment Forum, 2009:5-6):

- demonstrated the best transparency policies in comparison to companies in the other countries,
- reported on some type of ESG information,
- referred to the GRI guidelines in their sustainability reports, and
- made reference to the UN Global Compact in their sustainability reports.

Whereas international companies tend to produce separate ESG reports on a voluntary basis (Murphy & McGrath, 2013:218), South African companies include ESG reporting in integrated reports which, as mentioned previously, is mandatory for listed companies by the JSE and King III (Institute of Directors in Southern Africa, 2013:1).

From the examination of the literature on the various forms of non-financial reporting, the next section will explore the importance of ESG reporting for shareholders and other stakeholders.

2.3 THE IMPORTANCE OF ESG REPORTING FOR STAKEHOLDERS

The stakeholders of a company can be divided into two main groups, namely investors and others (such as employees, customers and suppliers). Both groups consider ESG information to develop a more comprehensive view of a company's performance, than would be the case if they focused only on conventional financial disclosure (Jaeger, 2011:60). Bassen and Kovács (2008:184) and Kruse and Lundbergh (2010:46) had indicated that ESG performance as set out in ESG reports, could be used by all stakeholders as a proxy for the quality of a company's management, as stakeholders would become better informed of the company's past and future endeavours, financially and otherwise (Warren & Thomsen, 2012:4).

According to De Villiers and Lubbe (1998:25), environmental reports illustrate a company's commitment to positive environmental policies and practices. Even though this statement is

based on environmental reports, it still shows the importance that holistic ESG reporting can have for all stakeholders.

In terms of institutional investors specifically, Warren and Thomsen (2012:2) noticed an increase in the demand for ESG disclosure. Institutional investors had the greatest reliance on ESG reports. Their reliance on ESG reports stemmed from the information being used to evaluate companies' short, medium and long-term value and performance for investment decision-making (Gasperini *et al.*, 2012:5). Sonnenberg and Hamann (2006:310) identified that increases in sustainability disclosure over time allowed investors to make better informed decisions about a company. This could be said for ESG reporting as well.

Pressure by investors has been claimed to be a reason for companies to improve their reporting (environmental and sustainability) over time (MacLean, 2012:102). Wilmshurst and Frost (2000:18) concluded that investors have considerable influence on company's environmental reports. Demands from investors for improved ESG reporting by management and therefore, better ESG reports to be delivered by companies are increasing (US Social Investment Forum, 2010).

For the other types of stakeholders, ESG reports can be considered important as the information disclosed could be used by them in the following manner. Potential employees could use ESG reports to decide which company to work for. Customers making choices about which companies to purchase from may consider ESG reports to gain greater insight into the companies' non-financial considerations (Eccles & Saltzman, 2011:58).

Incorrect, insufficient or irrelevant information in ESG reports could lead to all stakeholders being unsure of a company's future forecasts (Kruse & Lundbergh, 2010:48) and therefore hinder stakeholders in making properly informed decisions, either in terms of investors' investment decisions, or consumers' choice of products or services to purchase, or potential employees deciding which company to work for (Mitchell & Quinn, 2005:18).

In the next section, the researcher will focus on ESG reporting in the metals and mining industry internationally. As stated in the previous chapter, the decision to concentrate on the metals and mining industry was that this industry forms a large part of the FTSE/JSE All Share Index and makes a great economical contribution to the country's growth and employment. Investors are also very keen on this industry internationally.

2.4 ESG REPORTING IN THE METALS AND MINING INDUSTRY

Metals and mining companies have to contend with different ESG risks because of the industry in which they operate in (Bassen & Kovács, 2008:184). These companies have to constantly adapt to changing conditions on a local and international level, as this industry is a key aspect of many countries' economic state. South Africa's mining industry is no different, since it is the fifth largest mining industry in the world, based on GDP values (South Africa.info, 2012). Metals and mining companies have been identified as reporting extensively on environmental and social activities that have an impact on communities (Jenkins & Yakovleva, 2006:272).

The metals and mining industry is classified as a high-impact industry owing to its environmental impact (extraction of resources) and social impact (employees' risk of HIV/AIDS, injury or death) (Sonnenberg & Hamann, 2006:311). Therefore companies in the metals and mining industry should be producing adequate ESG reports (Gasperini *et al.*, 2012:30). This will give South African companies a competitive advantage from an investment perspective because relevant information on ESG concerns which affect decision-making is therefore provided.

The metals and mining industry was identified by De Villiers and Barnard (2000:16) as the one industry in South Africa where companies continuously produced more environmental reports than other industries. A higher level of environmental reporting by companies in this industry is associated with it being a high-impact industry (De Villiers & Barnard, 2000:19). Sonnenberg and Hamann (2006:311) found that a small percentage of South African companies that reported on environmental or social concerns, had international exposure and were located in the resource industry.

It has been suggested that metals and mining companies should produce ESG reports as a means of legitimising their operations to stakeholders, which are the most affected by metals and mining companies' activities (Gasperini *et al.*, 2012:3). In accordance with Jenkins and Yakovleva (2006:272), social and environmental reporting was seen as a means for metals and mining companies to defend their reputation and provide proof of their business operations to stakeholders. Legitimising business operations entails being perceived by stakeholders in a positive light. In academia, this is known as the 'legitimacy theory' (Aerts *et al.*, 2006:303; De Villiers & Lubbe, 1998:21). Wilmshurst and Frost (2000:22), however,

examined legitimacy theory in terms of environmental reporting and found no significant support for legitimacy theory as a reason for environmental disclosure.

According to De Villiers and Barnard (2000:16), companies should not be permitted to continue with business operations if their activities are in conflict with society. It was suggested that legitimacy can be improved using social and environmental reports to inform and change stakeholders' perceptions (Antonites & De Villiers, 2003:2; De Villiers & Lubbe, 1998:22). A company's legitimacy, transparency and communication with stakeholders are improved with ESG reporting. ESG reporting demonstrates to stakeholders what a company has undertaken and what its future strategies are. There are benefits for companies and stakeholders from producing ESG reports. These benefits will be discussed in the next section.

2.5 THE BENEFITS OF ESG REPORTING

From the literature reviewed, a number of benefits which companies and stakeholders can gain from the information contained in ESG reports were noted. These are summarised in Table 2.1.

The main benefit of ESG reporting across stakeholder groups is that it reduces information asymmetries (Warren & Thomsen, 2012:6; Brammer & Pavelin, 2008:121). According to De Villiers and Van Staden (2010:439), information asymmetry can be reduced to some degree due to legislation and accounting standards which stipulate what information should be disclosed to protect all stakeholders.

It sometimes happens that institutional investors have access to more information than minority shareholders, which places the latter at a disadvantage. Warren and Thomsen (2012:6) concurred that information asymmetry could happen when management knows more about a company's performance than stakeholders. They likewise stated that information asymmetry could be reduced through ESG reporting. Information asymmetry reduction could lead to greater transparency for the company. From the reports, it has been suggested that stakeholders will be in a better position to make well-informed decisions regarding their investments (Clark & Grist, 2014:3).

Table 2.1: Benefits associated with ESG reporting^(a)

Beneficiary	Benefit	Supporting reference(s)
Shareholders and Stakeholders	Reduces information asymmetries	Warren & Thomsen (2012:6)*; De Villiers & Van Staden, (2010:439)**; Brammer & Pavelin (2008:121)*
	Increases transparency	Brammer & Pavelin (2008:121)*; De Villiers & Lubbe (1998:21)**
Companies	Improves access to capital	Warren & Thomsen (2012:6)*; Park & Kowal (2011:5)*; Kruse & Lundbergh (2010:46)*
	Avoid future legal pressure to produce non-financial reports	Murphy & McGrath (2013:222)*; Brammer & Pavelin (2008:121)*; De Villiers & Lubbe (1998:21)**
	Gain a competitive advantage	Brammer & Pavelin (2008:121)*; De Villiers & Lubbe (1998:21)**
	Decrease in operational costs and risks	Warren & Thomsen (2012:6)*; Kruse & Lundbergh (2010:46)*; De Villiers & Lubbe (1998:21)**
	Increase employee commitment	Warren & Thomsen (2012:8)*
	Develop expertise	Brammer & Pavelin (2008:121)*; De Villiers & Lubbe (1998:21)**
	Enhance legitimacy of business operations or seek licence to operate	Brammer & Pavelin (2008:121)*; De Villiers & Lubbe (1998:21)**
	Prepared to avert and react to ESG risks	Warren & Thomsen (2012:6)*; Kruse & Lundbergh (2010:46)*
	Protect and enhance reputation	Warren & Thomsen (2012:8)*; Kruse & Lundbergh (2010:46)*; De Villiers & Lubbe (1998:20)**
	Encourage stakeholder recognition	Warren & Thomsen (2012:8)*; Brammer & Pavelin (2008:121)*; De Villiers & Lubbe (1998:21)**
(a) These benefits pertain to all types of non-financial reporting * International journal article; ** South African journal article		

Shareholders and stakeholders further benefit from ESG reporting because of increased transparency. Transparency allows stakeholders to become more informed, therefore allowing stakeholders to make better informed decisions (Brammer & Pavelin, 2008:121; De Villiers & Lubbe, 1998:21). For example, investors use ESG reports to assist with their investment decision-making process (Amran & Haniffa, 2011:143; Park & Kowal, 2011:4), and can therefore make better informed decisions when such non-financial information is made available.

There are also a few benefits which companies can gain from improved transparency. One such benefit is improved access to capital, which could assist the company to grow (Park & Kowal, 2011:5; Kruse & Lundbergh, 2010:46). Improved growth and access to capital owing to support from responsible investors could lead to increased profitability (De Villiers & Lubbe, 1998:20), as well as a positive influence on stock prices and reduced cost of capital (Warren & Thomsen, 2012:6). The relationship between financial performance and ESG reporting will be examined in more detail in Chapter Three.

The avoidance of political pressure and litigation in the future was identified by Murphy and McGrath (2013:222) as an important benefit of sound ESG reporting. Another benefit from ESG reporting is a decrease in companies' operational costs and risk, as well as reputation enhancement and protection (Warren & Thomsen, 2012:8; Kruse & Lundbergh, 2010:46; De Villiers & Lubbe, 1998:20). There are a number of other specific company benefits given in Table 2.1 that must be acknowledged.

With the benefits identified, it is necessary to establish what challenges companies are facing in terms of ESG reporting, for these to be overcome. The challenges identified in literature will be discussed in the following section.

2.6 THE CHALLENGES ASSOCIATED WITH ESG REPORTING

The challenges and concerns associated with producing ESG reports are summarised in Table 2.2.

Table 2.2: Challenges and concerns associated with ESG reporting^(a)

Party experiencing the challenge	Challenge	Supporting reference(s)
All stakeholders	Concerns regarding reliability	Gasperini <i>et al.</i> (2012:11)*; Park & Kowal (2011:3)*; De Villiers & Van Staden, (2010:444)**
	Concerns regarding the quantification of ESG issues	Bassen & Kovács (2008:183)*
Stakeholders (excluding investors)	Concerns that ESG reporting is exclusively done for investors	Bassen & Kovács (2008:185)*
Companies	Being predisposed not to produce ESG reports	Warren & Thomsen (2012:9)*; Antonites & De Villiers (2003:2)**
	Being uncertain about how to standardise ESG reports	Frías-Aceituno <i>et al.</i> (2012:45)*; Gasperini <i>et al.</i> (2012:11)*; Jenkins & Yakovleva (2006:274)*
	Being overwhelmed by the decision of what to disclose in the ESG report and what to exclude from it	Warren & Thomsen (2012:9)*
	Being unclear about the significance placed on ESG reports by stakeholders	Warren & Thomsen (2012:9)*
	Being pressurized to be perceived as socially responsible	Warren & Thomsen (2012:9)*
(a) These benefits pertain to all types of non-financial reporting * International journal article; ** South African journal article		

The number of challenges associated with ESG reporting is less than the benefits, which is a positive sign. The first challenge identified was the reliability of ESG reports. Stakeholders have stated in a previous study that they require information disclosed in non-financial reports

to be assured of its reliability (De Villiers & Van Staden, 2010:444). Ernst and Young (2014:1, 8) undertook a survey to investigate institutional investors' view on the availability and quality of non-financial information reported by companies. It was found that investors who used non-financial (i.e. ESG) information, preferred to use such information which came directly from the company, not a third party, as it was seen to be more credible and reliable.

Bassen and Kovács (2008:183) argued that ESG reporting cannot be easily quantifiable. This means that the information in ESG reports cannot be simply transformed into a performance measurement for analysis purposes. Another challenge found by Bassen and Kovács (2008:185) is that ESG reports have been seen by many stakeholders to be exclusively written for shareholders and investment professionals. This perception by stakeholders could be because of the ESG information that is disclosed and when reporting occurs in a year appears to be aimed at investors' needs for ESG reports. Clark and Grist (2014:18) found in their survey that 13 per cent of companies acknowledged investors as their primary audience for integrated reports, while 87 per cent stated that their reports were aimed at all stakeholders.

The lack of standardisation in ESG reports is a challenge for both stakeholders and companies. Standardised non-financial reports are favoured by stakeholders who use the reports in their various decision-making processes (Frías-Aceituno *et al.*, 2012:45). Initiatives like GRI and IIRC were designed to assist companies to bring a standard format to their financial and non-financial reporting. Standardisation allows for comparability of different companies' non-financial reports by companies and stakeholders, to assess and measure financial and non-financial performance and risk management (Jenkins & Yakovleva, 2006:274).

Another challenge experienced by companies was a predisposition not to produce comprehensive reports (Warren & Thomsen, 2012:9). This predisposition results from companies wanting to maintain a positive reputation by disclosing only ESG information that will do so. The challenge presented to stakeholders, is that they do not receive all pertinent ESG information required to make informed investment decisions. This could also become a problem for companies as it limits their ability to improve on areas of concern. As stated by Antonites and De Villiers (2003:2), the reason behind South African companies decreasing the amount of disclosure (predisposition not to produce comprehensive reports) in environmental reports, was thought to be apprehension of liability or litigation.

The researcher is of the opinion that challenges associated with ESG reporting can be overcome, with the assistance of a number of initiatives, mainly those that have been introduced earlier in this chapter. The initiatives discussed will also be examined in greater detail in Chapter Three.

2.7 SUMMARY AND CONCLUSIONS

The purpose of this chapter was to provide a detailed review of ESG reporting. The chapter began with a discussion on the different forms of non-financial reporting that have been used over the years. Figure 2.1 illustrated the progress of non-financial reporting over time. Environmental reporting was identified as the first form of non-financial reporting used. Companies then progressed towards publishing social reports. In social reports, both environmental and social considerations were reported on. From the combination of environmental and social reporting came sustainability reporting.

Some studies noted that corporate governance featured in sustainability reports alongside environmental and social issues. Reporting continued to evolve into integrated reporting which refers to the process of disclosing financial and non-financial information in one report. It was concluded that ESG reporting represents the non-financial aspect of integrated reporting.

Next, the importance of ESG reporting for stakeholders was addressed. Stakeholders' use of ESG reports for their relevant decision-making process was the most commonly found reason for companies to publish ESG reports. ESG reporting for the metals and mining industry was examined as it was considered necessary for the study's analysis. It could be concluded from the literature that metals and mining companies have the tendency to publish more ESG reports than companies in other industries. This is due to two most notable features. Firstly, the metals and mining industry is considered a high-impact industry and secondly, most metals and mining companies are large companies, which are more likely to have the resources to publish ESG reports than small companies.

There were far more benefits of ESG reporting for companies than for stakeholders. It is important for benefits and challenges related to ESG reporting to be recognised, as it can assist in the improvement of ESG reporting. Challenges can become benefits for companies and stakeholders, with the assistance of a number of initiatives, such as the GRI and the UN

Global Compact. Two specific challenges that were identified in the literature were lack of standardisation and reliability of ESG reports. Standardisation and reliability can be achieved by companies when guidelines and other initiatives are used.

To conclude this chapter, the researcher noted from KPMG International (2013:11-12) that the number of companies publishing non-financial reports internationally has grown over the last two years since the last survey (in 2011) was conducted. The inclusion of non-financial information disclosed as part of the integrated report has not increased as much as expected, but this can be attributed to many countries that still do not require integrated reports like South Africa's JSE does.

According to The Albert Luthuli Centre for Responsible Leadership (2013) study, South African companies are global leaders in integrated reporting. From the literature reviewed, the researcher acknowledges that many studies that considered stakeholders needs from non-financial reports, still seemed to be requesting more and more non-financial information to be disclosed than companies apparently are (Ernst & Young, 2014; MacLean, 2012; Warren, & Thomsen, 2012; Jaeger, 2011).

In the next chapter, the researcher will examine the factors that have been identified as influencing the extent of ESG reporting by listed companies. These factors will serve as the study's independent variables in the empirical analysis.

CHAPTER THREE

FACTORS INFLUENCING THE EXTENT OF ESG REPORTING BY LISTED COMPANIES

3.1 INTRODUCTION

In the previous chapter the construct of ESG reporting was defined and its historic development discussed. The importance of ESG reporting internationally and in South Africa was also reviewed. In this chapter, the factors that could potentially influence the extent of ESG reporting will be investigated. Factors were categorised based on the three levels of the business environment, namely the macro, market, and micro environment. These factors represent the independent variables in the theoretical framework to be tested. The control that companies have in each of these levels is shown in Table 3.1.

Table 3.1: Factors within the macro, market and micro environments that could influence the extent of EGS reporting

Business Environment	Level of control that companies have over factors in the business environment	Factors
Macro	None	Inclusion in an RI index
		Legal system in a country
		Country status
Market	Some	Industry
Micro	Extensive	Use of GRI Guidelines
		Being a UN Global Compact participant
		Financial performance
		Company size
		Board composition
		Ownership concentration

Source: Adapted from Bosch, Tait & Venter (2006)

3.2 INCLUSION IN AN RI INDEX

An RI index can be defined as a “stock price index of a series of companies which meet the requirement of corporate social responsibility” (Sun *et al.*, 2011:677). Financial institutions and research companies were identified as the initiators of RI indices (Vives & Wadhwa, 2012:2; Sun *et al.*, 2011:677). The RI indices were launched to assist investors in benchmarking companies’ ESG performance. The most prominent of these indices are the

Domini 400 Social Index, FTSE4Good Indices Series and the Dow Jones Sustainability Indexes series.

Ho (2013:11) and De Souza Cunha and Samanez (2012:2) explained that RI indices have an important role in encouraging companies to improve their business operations and reporting on ESG policies and practices. The researcher is of the opinion that the introduction of more RI indices should assist in the development of higher standards for ESG implementation and reporting. ESG criteria for RI indices are the differentiating factor between RI indices and conventional indices (Ho, 2013:1).

The increasing acceptance of RI in the investment community has encouraged the introduction of more RI indices in recent years (Ho, 2013:11; López, Garcia & Rodriguez, 2007:285). Some of the indices are the Calvert Social Index, the JSE SRI Index, the Brazilian BOVESPA ISE and the Ethibel Sustainability Index. To gain some insight into the nature and purpose of RI indices, a number of prominent ones will be discussed in the following sections.

3.2.1 The Domini 400 Social Index

The Domini 400 Social Index (often abbreviated as DSI400 or DSI) was the first RI index launched in the USA by Amy Domini and Kinder, Lydenberg, Domini & Company (KLD) in 1990. KLD was the first financial analyst to use ESG factors for the construction of an RI index (Sun *et al.*, 2011:677; Griffin & Mahon, 1997:16). This index only lists 400 US companies which are selected on the basis of their ESG performance. The DSI400 is well known for being a highly diversified index (MSCI ESG Research, 2013c; Baird *et al.*, 2012:371; Peiris & Evans, 2010:105; FTSE, 2009).

The DSI400 uses a capitalisation-weighted index which is modelled on the S&P500 Index (Statman, 2000:30). In addition to measuring ESG performance, the DSI400 uses exclusionary screening for the selection of companies. For example, companies conducting business in the tobacco, weapons, alcohol or gambling industries are excluded from the DSI400 (MSCI ESG Research, 2013c; FTSE, 2009; Statman, 2000:30). In July 2009, the DSI400 index was renamed the FTSE (Financial Times Stock Exchange) KLD 400 Social Index. This was because the index started being distributed under the FTSE KLD name in collaboration with FTSE, which calculated and licensed KLD indices (FTSE, 2009). In

September 2010, the FTSE KLD 400 Social Index moved to the MSCI ESG Indices and has since become known as the MSCI KLD 400 Social Index (MSCI ESG Research, 2013c; De Souza Cunha & Samanez, 2012:4). The next RI index series to be established in the global context was the Dow Jones Sustainability Index series, which will be discussed in the following section.

3.2.2 The Dow Jones Sustainability Index Series

The Dow Jones launched its own range of sustainability indices in 1999 (abbreviated as the DJSI series). The DJSI series comprises 10 per cent of companies which are included in the Dow Jones Global Index. The DJSI collaborates with STOXX Limited and Sustainable Asset Management, to create a benchmark for investors to analyse companies and manage portfolios in terms of sustainability and social concerns of companies (De Souza Cunha & Samanez, 2012:4; Managi, Okimoto & Matsuda, 2012:1517; Ortas & Moneva, 2011:400; Gjølberg, 2009:14).

The DJSI series assessment method for inclusion in the RI index has been classified as the scoring method. The criteria utilised for scoring are industry-specific criteria for companies in the industry. The criteria are based on environmental, social and economic concerns with which a company must comply to be included in the index. Companies are rated in terms of each defined and weighted criterion on an annual basis. This ensures that the criteria are current in the changing investment and economic environment. This also helps in identifying companies deemed to be sustainable leaders in an industry (Ortas & Moneva, 2011:400; Sun *et al.*, 2011:677-678; Fowler & Hope, 2007:246; López *et al.*, 2007:289). The criteria being industry-specific, link to a factor in the market business environment which will be discussed in the theoretical framework (Table 3.1).

The DJSI does not take corporate governance criteria into consideration when assessing companies. This is different from other RI indices such as the JSE SRI Index, where ESG criteria are used, and corporate governance is just as important as the other two criteria. The use of dissimilar criteria across RI indices means that companies are less comparable, and this is challenging for researchers, investors and other stakeholders who may use such information in decision-making or research, to compare companies across the world. The next RI index series to be launched into the global market was that of the FTSE4Good Index Series.

3.2.3 The FTSE4Good Index Series

The FTSE4Good Index Series was established by FTSE in 2001. The FTSE is jointly owned by The Financial Times and the London Stock Exchange. The series of indices was developed for investors to distinguish internationally companies which meet global CSR standards (De Souza Cunha & Samanez, 2012:4; Collison *et al.*, 2009:35; Gjølborg, 2009:14; Martin Curran & Moran, 2007:530).

Companies that are presently listed on one of the following four indices are eligible for inclusion in the FTSE4Good Index Series: The FTSE All Share Index, the FTSE All-World Europe Index, the FTSE US Index, and the FTSE All-World Developed Index (Managi *et al.*, 2012:1518; Collison, Cobb, Power & Stevenson, 2008:16).

All the FTSE4Good Index Series use a risk and performance assessment method of companies for inclusion into the index (Sun *et al.*, 2011:681). For the FTSE4Good Index Series, companies which want to be included are required to meet criteria built on three original principles set when the index began, namely environmental, social and stakeholder, and human rights. Additional criteria were added to the list over the years, namely supply chain labour standards (introduced in 2004), countering bribery (introduced in 2005), climate change (introduced in 2007) and human rights criteria specifically aimed at low-impact companies (introduced in 2009). Similarly to the DJSI series, the FTSE4Good Index Series excludes companies that are involved in business operations in weapons, tobacco, alcohol and additionally the extraction of uranium through a process of negative screening (FTSE, 2010b; Collison *et al.*, 2009:39; Collison *et al.*, 2008:16-17; Martin Curran & Moran, 2007:530).

To be included in the index series, companies also need to meet criteria set out on company policies, management and reporting. The FTSE4Good Index Series classifies industries based on their environmental impact, as low, medium or high-impact. The level of impact at which a company is classified, will determine the number of specific criteria that need to be satisfied for inclusion in the index, and thereafter maintaining that inclusion status (Collison *et al.*, 2008:17; Martin Curran & Moran, 2007:530).

The FTSE4Good Index Series is constructed into two formats – a benchmark index and a tradable index. Companies are first included in the benchmark index. Then they are included in a tradable index (the FTSE4Good UK and Europe or the FTSE4Good USA), based on the

benchmarked company's market capitalisation (Collison *et al.*, 2008:15; Martin Curran & Moran, 2007:530). The composition of the tradable indices is reviewed every six months to establish if companies should be included, may remain, or be removed from the indices. The tradable indices are used to provide a small representation of the larger FTSE4Good benchmarks (Managi *et al.*, 2012:1518; Collison *et al.*, 2009:40; Martin Curran & Moran, 2007:530).

3.2.4 Other international RI indices

Other international RI indices often discussed in literature are the following: Morningstar Socially Responsible Investment Index (launched in 2003); Global Challenges Index series (launched in 2007); STOXX Global ESG Leaders and STOXX Sustainability Indices (launched in 2011); and the MSCI ESG Indices Series (launched in 2010) (Ho, 2013:6; Managi *et al.*, 2012:1518; Sun *et al.*, 2011:678). The MSCI ESG Indices Series will be discussed in more detail as their ESG methodology and scores were used in this study.

MSCI Inc. launched their MSCI ESG Indices Series in September 2010. Their indices screen companies based on ESG performance. The MSCI ESG Indices Series consists of four categories of indices, namely Best-in-Class, Socially Responsible Investment, Environmental and Ex Controversial Weapons (MSCI ESG Research, 2013b; Sun *et al.*, 2011:678-679). Each of the categories will be briefly explained next.

In the Best-in-Class classification, there are the MSCI World ESG Index and the MSCI USA Investable Market Index ESG Index. The companies in this category of indices are the top rated companies compared to companies in the same industry, rated by MSCI ESG Research in investment opportunities (MSCI ESG Research, 2013b; 2013e).

MSCI's Socially Responsible Investment classification consists of the MSCI World SRI and MSCI KLD 400 Social indices. The SRI indices represent companies deemed socially responsible, with high ESG scores (MSCI ESG Research, 2013b).

The Environmental category is made up of the MSCI Global Climate Index and the MSCI Global Environment Index. The MSCI Global Environment Index inclusion for companies is based upon companies performing well in five areas, namely alternative energy, sustainable water, green building, pollution prevention, and clean technology. The MSCI Global Climate

Index represents companies which mitigate the reasons behind climate change, and are considered leaders in the industry. Recall from Figure 2.2 that three areas are used for company selection into the MSCI Global Climate Index, namely renewable energy, clean technology and efficiency, and future fuels (MSCI ESG Research, 2013b).

The Ex Controversial Weapons category consists of the MSCI ACWI (All Country World Index) Ex Controversial Weapons Index. The reason it is called Ex Controversial is, that this index excludes companies of the MSCI parent index (MSCI ACWI) that are engaged in controversial weapons operations (MSCI ESG Research, 2013b; 2013d; 2013e).

In this study, the MSCI ESG IVA model will be used for the empirical analysis. The IVA model's universe is the MSCI World ESG Index, which is classified under the Best-in-Class category (MSCI ESG Research, 2012). Although most RI indices were created in developed markets, two emerging markets were quick to follow suit in establishing their own RI indices. In the next section a discussion is provided on two important emerging market RI indices in South Africa and Brazil respectively.

3.2.5 RI indices in emerging markets

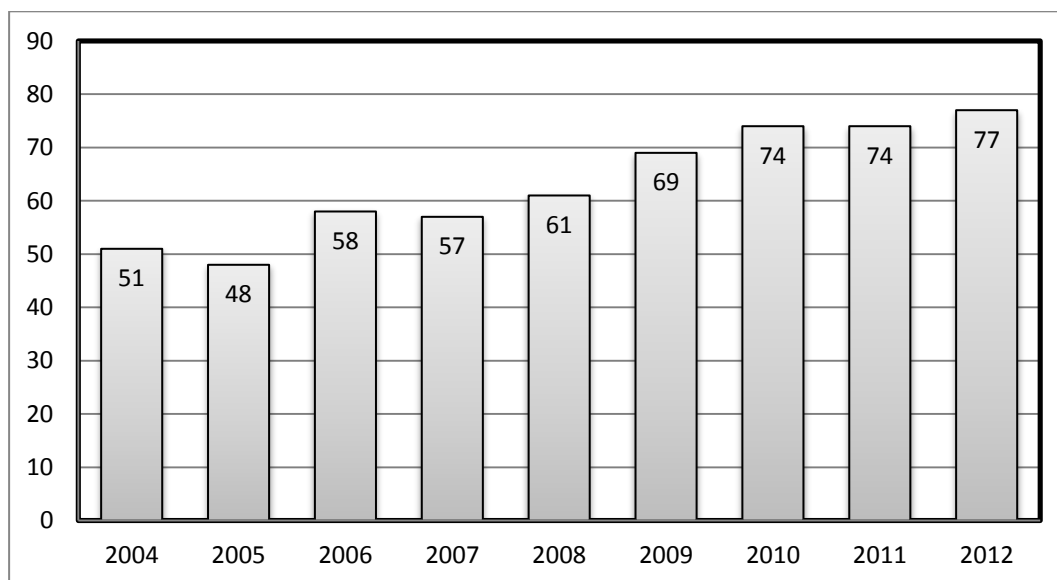
The first RI index launched by a stock exchange in an emerging market and on the African continent was that of the JSE SRI Index in 2004 in South Africa. The JSE SRI Index was developed by the JSE as a means of an ESG benchmark index for all listed companies. The JSE SRI Index recognised companies that had existing sustainability policies and practices. The RI index had hoped this would encourage companies that were neglecting such areas to improve on them. The JSE SRI Index was created with the intention of providing investors with an additional means of assessing and evaluating companies on the ground of sustainability, for investors' decision-making process (Ho, 2013:8; Johannesburg Stock Exchange, 2013a; Johannesburg Stock Exchange SRI Index, 2011).

The JSE SRI Index uses a risk and performance assessment method, like the FSTE4Good index series, to assess companies for inclusion into the index. The requirements for inclusion are concerned with ESG and economic sustainability of companies reporting, policies, strategies and management. Additional criteria have been incorporated into the assessment of companies, namely HIV/AIDS and B-BBEE. These additional criteria are specific and unique to South Africa. Therefore, the differentiating factor between the JSE SRI Index and the

FTSE/JSE All Share Index is that the former incorporates ESG considerations into the assessment process of companies for inclusion into the index, but the latter does not. The JSE SRI Index makes use of a positive screening strategy that is used against the criteria set out for consideration into this index (Johannesburg Stock Exchange SRI Index, 2011; Johannesburg Stock Exchange, 2010; Ackers, 2009:7; Hamman & De Cleene, 2005:131).

Sonnenberg and Hamann (2006:306) explained the reason behind why the JSE SRI Index, unlike its counterpart in the UK, the FTSE4Good Index Series, uses positive rather than negative screens. The reason was the importance of the metals and mining industry (extraction industry) in the South African economy. Figure 3.1 presents the number of companies included in the JSE SRI Index since its launch in 2004.

Figure 3.1: Companies included in the JSE SRI Index over time



Source: Researcher's own construction based on Johannesburg Stock Exchange SRI Index (2013).

As indicated in Figure 3.1, there has been a gradual increase in the number of companies included in the index. This can be interpreted as a sign of increased interest by JSE-listed companies in ESG considerations – the JSE SRI Index reviews companies' "policies, management systems and performance", as well as ESG reporting. This review by the JSE SRI Index takes place on an annual basis, to assess whether companies may remain included in the RI index (Johannesburg Stock Exchange SRI Index, 2011).

Following the JSE SRI Index's launch in South Africa in 2004, Brazil's stock exchange, BM&FBOVESPA, established their Corporate Sustainability Index (ISE) in December 2005. The ISE was developed with technical and financial assistance from World Bank's IFC (De Souza Cunha & Samanez, 2012:4; Siddy, 2009:16). Brazil's ISE invites companies that have the most liquid shares to complete a questionnaire, which extensively examines the company in seven areas, namely environmental, economic, social, nature of the product, climate change, corporate governance and general (transparency, corruption, management policies) (BM&FBOVESPA, 2013; De Souza Cunha & Samanez, 2012:5; Vives & Wadhwa, 2012:10).

Brazil's ISE uses a cluster analysis method to assess selected companies which submit completed questionnaires. This is to determine the best-performing companies for inclusion in the index. ISE uses a positive screening method, similar to the JSE SRI Index for including companies in the index, which simply means that the ISE does not exclude companies based on what their business or sector is (De Souza Cunha & Samanez, 2012:5; Vives & Wadhwa, 2012:10; Sun *et al.*, 2011:681).

In the present study, the JSE SRI Index will be used as an independent variable in the empirical analysis. In addition, given the scope of the study, a niche RI index in South Africa will be focused upon, namely the Nedbank Green Index, which will be discussed next.

3.2.6 The Nedbank Green Index

The Nedbank Green Index was established in June 2008, and functions as a benchmark for investors who are concerned with environmental matters. The index measures companies' performance, in terms of climate change and sustainable environmental practices, strategies and reporting. Companies included in the Nedbank Green Index are selected from the top 100 FTSE/JSE-listed South African companies. Companies are weighted on environmental and liquidity measures that are evaluated with reference to the CDP and Clean Development Mechanism. As of December 2012, the index consisted of 43 JSE-listed companies (Nedbank Group, 2013; Nedbank Capital, 2012a; 2012c; Schnehage, 2012).

Companies included in the index need to ensure that their environmental practices, policies and reporting meet the requirements of the index to maintain their inclusion status. Companies which do not adhere to the requirements are removed from the index. The CDP and Nedbank Green Index review the requirements for companies on a quarterly basis. This is

to ensure that the rules are still stringent, because companies are improving their policies and practices. Companies that are excluded from the RI index can become a participant of the Nedbank Green Index again. Inclusion again can take place if companies improve their reporting, policies and practices to meet the requirements of the index. Inclusion in the Nedbank Green Index demonstrates to stakeholders that the company has made a long-term commitment to addressing environmental issues in a sustainable manner (Johannesburg Stock Exchange, 2012; Nedbank Capital, 2013; Nedbank Capital, 2012a; 2012b).

3.2.7 Ethical Indices

Some researchers use the term ‘ethical indices’ when making reference to RI indices (Collison *et al.*, 2009:36). This is not entirely incorrect as a number of these indices include companies that comply with ethical criteria based on Shari’ah (Islamic) principles. Some of the indices include: Dow Jones Islamic MarketTM World Index; FTSE NASDAQ Dubai Index Series; FTSE Bursa Malaysia Hijrah Shariah and EMAS Shariah indices; FTSE SET Shariah Index; FTSE TWSE Taiwan Shariah Index; and the FTSE SGX Shariah Index Series (S&P Dow Jones Indices, 2013; FTSE, 2010a).

In recognition of the growth in Shari’ah-compliant investing, the JSE also created two indices which track the performance of Shari’ah-compliant companies listed on the stock exchange. The FTSE/JSE Shari’ah All Share index was launched in 2007, and the FTSE/JSE Shari’ah Top 40 index in 2008 (Johannesburg Stock Exchange, 2013b; Johannesburg Stock Exchange SRI, 2011; Johannesburg Stock Exchange, 2008).

These indices will not be included in the empirical analysis, as the study’s main focus is on ESG reporting and not the Shari’ah principles that are followed in these indices. In the next section, the financial performance of RI indices relative to conventional indices will be examined.

3.2.8 The financial performance of RI indices relative to conventional indices

Several studies have found that conventional indices do not outperform RI indices, which has not been the initial thought regarding the comparison between these two categories of indices (Vives & Wadhwa, 2012:7; Collison *et al.*, 2008:18; Schröder, 2007:332). RI indices were

initially expected to underperform because the portfolios in RI indices were less diversified than conventional indices (Managi *et al.*, 2012:1512).

Statman (2006:104) stated that a relationship between expected returns of RI companies and conventional companies could be determined by comparing companies in RI indices (such as DJSI or JSE SRI Index) with companies in conventional indices (such as Dow Jones Industrial Index or the FTSE/JSE All Share Index). Bauer, Koedijk and Otten (2005:1766) found that the performance of sustainability indices was inferior in comparison to conventional indices. This can be said to be in line with the efficient market hypothesis. This theory states firstly, that securities are always in equilibrium. Secondly, it states that investors cannot “beat the market” and that all significant information about the security is reflected in the share prices (Brigham & Daves, 2007:173).

Managi *et al.* (2012:1512) surmised in their literature that companies which are more CSR inclined might benefit from higher financial performance than conventional companies. The restrictions on RI indices could lead these indices to underperform in comparison to conventional indices. It was established however, that conventional indices did not outperform RI indices, as was found in other studies (Ho, 2013:1; Managi *et al.*, 2012:1523)

In the next section on RI indices as an influencing factor on ESG reporting, the benefits will be discussed for companies being included in an RI index.

3.2.9 The benefits companies gain by being included in an RI index

Although the DJSI and the FTSE4Good Index Series are high profiled RI indices internationally, other RI indices also play a considerable role in promoting change in the way companies conduct business and report ESG considerations. These indices have created awareness among companies and investors regarding ESG challenges and trends in industries (Ho, 2013:1).

Companies that are included in RI indices strive to remain included. Likewise, companies which are excluded strive to be included in RI indices generally. Companies aim for inclusion by making every effort to meet the criteria set out by RI indices to become included and reap the benefits (Aktas, De Bodt & Cousin, 2011:1754; Collison *et al.*, 2009:36; Fowler & Hope, 2007:246).

Being included in these indices informs investors that those companies are performing well in terms of ESG risk management. Companies expect their inclusion in an RI index to offer better access to lower cost equity and debt capital in the financial markets (Vives & Wadhwa, 2012:6). The share prices of companies included in RI indices are expected to be positively influenced by their inclusion. Martin Curran and Morgan (2007:535) found that inclusion in a RI index did not lead to increased share prices, but there were other benefits gained by inclusion over the long term. A reputational and competitive advantage are typical benefits created for companies that are included in RI indices (Ortas & Moneva, 2011:396; Peiris & Evans, 2010:105; Fowler & Hope, 2007:246; López *et al.*, 2007:289).

Collison *et al.* (2008:19) determined that companies which were included in RI indices tended to provide stakeholders with higher standards of disclosure of ESG practices and performance, in comparison to companies which were only included in conventional indices. In light of the above, companies should strive to be included in an RI index, as the criteria set by RI indices demonstrate to stakeholders that the management of the company are aware of ESG concerns. Furthermore, companies strive to address the ESG concerns. Based on the above discussion, the following null hypotheses were empirically tested in this study:

H_{0,1}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and inclusion in the JSE SRI Index.

H_{0,2}: There is no statistically significant difference between the extent of ESG reporting by JSE-listed companies included in the JSE SRI Index and those excluded from the index.

H_{0,3}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and inclusion in the Nedbank Green Index.

H_{0,4}: There is no statistically significant difference between the extent of ESG reporting by JSE-listed companies included in the Nedbank Green Index and those excluded from the index.

H_{0,5}: There is no statistically significant relationship between the extent of ESG reporting by international Metals and Mining companies and inclusion in the FTSE4Good Index Series.

H_{0,6}: There is no statistically significant difference between the extent of ESG reporting by international Metals and Mining companies and inclusion in the FTSE4Good Index Series.

The second factor in the macro business environment that could influence the extent of ESG reporting is that of a country's legal system.

3.3 LEGAL SYSTEM IN A COUNTRY

Klapper and Love (2004:703) noticed that different countries' legal systems tended to have different effects on ownership structure, access to capital, the cost of finance from external sources, market valuation, level of governance, and dividend pay-out ratios. A distinction can be made between two broad classifications of legal systems, namely civil law and common law (Gjølberg, 2009:12; Aerts *et al.*, 2006:300; Mitton, 2004:410; Halme & Huse, 1997:138). According to the US Central Intelligence Agency (2013) World Factbook, there are a number of other legal systems as well, for example, customary law, European Union law, French law, Islamic law, Roman law, Roman-Dutch law, Spanish law and United States law. Studies in the field of ESG reporting generally refer to civil law or common law systems.

Civil law is derived from the Roman Empire and is considered the most widely dispersed legal system around the world. The main feature of a civil law system is that the laws are organised written codes, and countries may have more than one code in their legal system (US Central Intelligence Agency, 2013; Graff, 2008:62). As stated by Frías-Aceituno *et al.* (2012:47), civil law is more concerned with the interest of stakeholders than common law is. They found this to be a factor which leads to companies producing integrated reports.

Common law is often synonymous with English common law, and is the second most widespread legal system. The principal attribute of common law systems is that there is a relationship between the state and courts. Court judges are duty-bound to their decisions by the rules and doctrines that were set out by earlier English courts (US Central Intelligence Agency, 2013; Graff, 2008:62). Different legal systems afford investors different levels of protection (Klapper & Love, 2004:703). Frías-Aceituno *et al.* (2012:47) also argued that in contrast to civil law, common law is more orientated towards shareholders' protection, in that financial disclosure under common law is more predominant than ESG reporting is.

Graff (2008:63) claimed that common law is more flexible in dealing with financial matters than civil law is. Graff (2008:63) extended this view of financial concerns to investor protection and a country's legal system. He suggested that civil law countries should be able to protect investors more adequately than common law countries, which give legal power to the state. However, the flexibility and adaptability of the common law legal system suggest that it could be the better protector of investors' financial and ESG concerns. Graff (2008:76) concluded that although investors received different treatment across the varying legal systems, neither system was superior to the other.

In terms of companies' reporting, voluntary reporting in one country may be a legal regulation in another country. In South Africa, for example, there is legislation (for e.g. the Companies Act No. 71 of 2008) (Henning, 2010:23; SAICA, 2008) as well as voluntary frameworks (for e.g. King III) to protect stakeholders (Institute of Directors in Southern Africa, 2013; SAICA, 2008). South Africa's legal system is made up of a combination of common law, customary law and Roman-Dutch civil law; therefore it is known as a mixed law legal system (US Central Intelligence Agency, 2013).

Klapper and Love (2004:723) claimed that companies in a country with a weak legal system to protect shareholders placed more importance on corporate governance. Therefore, despite the King III not being legislation in South Africa, it is a great driver behind a company's corporate governance and disclosure (Institute of Directors in Southern Africa, 2013). Klapper and Love (2004:704) stated that companies could improve the protection of investors by increasing their disclosure rate and quality. Companies doing so would demonstrate their intention of ensuring more protection for shareholders. In addition, it would offset the country's 'weak' legal system.

The impact of a country's legal system on integrated reporting was investigated by Frías-Aceituno *et al.* (2012:46-47). They found that when a sophisticated legal system exists in a country, companies were more likely to be responsible and disclose more information on non-financial performance. A clear distinction must be kept between better protection of shareholders and better disclosure by companies with either civil or common law legal systems. The purpose of legislation in the context of this study is to protect the interest of shareholders and stakeholders through ESG reporting. For this study the resulting null hypotheses on legal systems were thus formulated:

H_{0,7}: There is no statistically significant relationship between the extent of ESG reporting by Metals and Mining companies and the type of legal system of the country where the company has its primary listing.

H_{0,8}: There is no statistically significant difference between the extent of ESG reporting and the type of legal system of the country where Metals and Mining companies have their primary listing.

3.4 COUNTRY STATUS

A country's status as developed or emerging is considered as an influencing factor of ESG reporting in this study. There has been a considerable rise in the level of interest given to emerging markets in recent years (Sinclair & Yao, 2011), and with this comes the need to better understand this market and its characteristics. In terms of classifying a country, there is the economic size of the financial market relative to the whole economy, and the wealth, quality, depth and breadth of the capital market can be considered as well (Marocco, 2010:10).

A country is defined as developed by Standard & Poors /International Finance Corporation if the country has a Gross National Product (GNP) per capita which exceeds that of the World Bank's high income threshold. A country has to maintain a high GNP for at least three consecutive years (Marocco, 2010:17). MSCI ESG Research (2014:1) classifies countries as developed when their Gross National Income (GNI) per capita is 25 per cent above the World Bank's upper income threshold for three consecutive years as well. MSCI ESG Research (2014:1) also considers the size and liquidity requirements for country classification and market accessibility.

The World Bank Group (2012) classifies countries based on the GNI per capita. There are four groups, namely low income (\$1,025 or less), low middle income (\$1,026 to \$4,035), upper middle income (\$4,036 to \$12,475) and high income (\$12,476 or more), into which countries can be classified into. Low income and low middle income countries are defined by the World Bank Group (2012) as emerging markets (Hagart & Knoepfel, 2007:5). The three different sources of definitions all converge on using a country's income and invest-ability for classification purposes.

According to the Lubin, Esty, Lauterbach, Miller, Raza & Masland (2011:14), emerging market economies are expected to expand at a far greater rate than those of developed markets in the near future. The sustainability challenges faced by these markets can be seen as both a risk and an opportunity for the companies in these countries. The challenges are the fast population growth and the need to improve the living standards in such countries, which will lead to an increase in consumption and greater strain on natural resources (Lubin *et al.*, 2011:14; Marocco, 2010:11). Lubin *et al.* (2011:14) stated that companies in emerging markets therefore, have the potential to implement practices and business models which are geared to sustainability and ESG reporting.

There are many distinct differences between developed and emerging markets. In terms of social issues, differences typically include unemployment and poverty levels (Mănescu, 2011:100; Hagart & Knoepfel, 2007:6). Marocco (2010:20) has stated that there tends to be less control over corporate governance in emerging markets than in developed countries. Different countries tend to have varying regulations and recommendations for corporate governance issues, such as South Africa's King III report (Institute of Directors in Southern Africa, 2013; Jenkins & Yakovleva, 2006:276). Marocco (2010:22) acknowledged that positive relationships have been found between companies in emerging and developed markets and their corporate governance as a result of legislation and voluntary codes.

Lubin *et al.* (2011:14) acknowledged that ESG reporting in emerging markets was improving, but only a small share used reporting guidelines, such as the GRI guidelines. Marocco (2010:11) has remarked that companies' attention to ESG considerations has increased significantly in emerging markets. According to the Social Investment Forum (2009:5), listed companies in South Africa had greater transparency than companies in other emerging markets due to the high standard of ESG reporting in South Africa. A large constraint with ESG reporting is the actual disclosure of environmental and social risks that occur. This constraint has been found to be the case with companies in emerging markets (Marocco, 2010:11).

The present study could present some interesting findings to examine whether there is a difference in non-financial reporting depending on country status. The following null hypotheses were consequently derived:

H_{0,9}: There is no statistically significant relationship between the extent of ESG reporting by Metals and Mining companies and the status of the country where the company has its primary listing.

H_{0,10}: There is no statistically significant difference between the extent of ESG reporting and the status of the country where Metals and Mining companies have their primary listing.

In the subsequent section, industry as an influencing factor of ESG reporting is identified and discussed. In Figure 3.1, industry is classified as a market business environment.

3.5 INDUSTRY

The industry in which a company operates has been found to be a key factor in influencing the extent of corporate reporting (Cormier & Magnan, 2007:614; De Villiers & Barnard, 2000:16; Halme & Huse, 1997:138). Nowhere is the influence of the industry more applicable than in the area of ESG reporting. The reasons for the differences in non-financial reporting have been found to be dependent on industry-specific influences such as unique ESG concerns, different regulations, political challenges and stakeholder demands (Brammer & Pavelin, 2008:122; Van Breuden & Gössling, 2008:418; Aerts *et al.*, 2006:304; Gray *et al.*, 1995:70).

The JSE SRI Index classifies companies and industries based upon their environmental impact on key areas (such as climate change, water and air pollution, waste and water consumption), as low, medium or high-impact. On each level, there are specific criteria set that companies in that level need to adhere to for inclusion in the index (Johannesburg Stock Exchange SRI Index, 2011). Companies with a higher impact on the natural environment tend to have better non-financial reporting because there is greater pressure from the stakeholders in those companies. High-impact companies include companies operating in the mining, oil and gas, chemicals, construction and forestry sectors (Brammer & Pavelin, 2008:123; Halme & Huse, 1997:142).

Cormier and Magnan (2007:618) suggested that investors should pay less attention to reports of companies in environmentally sensitive industries (high-impact industries) as these tend to be less reliable than those in lower impact industries. Even with this claim by Cormier and

Magnan (2007:614), industry was still used as an influencing variable in their study on environmental reporting.

In two separate studies conducted by Antonites and De Villiers (2003:7) and De Villiers and Barnard (2000:21), on environmental reporting among resource companies compared to industrial companies in South Africa, it was found that more resource companies reported on environmental policies and performance than industrial companies. This was not seen as surprising, in both studies, considering the high environmental impact that metals and mining companies have because of operations.

It is expected in this study that the companies investigated which operate in a high-impact industry will have better disclosure on ESG considerations than companies in lower impact industries. From the review of literature, the consequential null hypotheses were empirically tested:

H_{0,11}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and the industry in which the company operates.

H_{0,12}: There is no statistically significant difference between the extent of ESG reporting by JSE-listed companies and the industry in which the companies operate.

The GRI guidelines have been identified as another influencing factor on ESG reporting in the micro business environment (Figure 3.1) where companies have extensive control over business activities. The GRI guidelines will be the next topic discussed.

3.6 USE OF THE GLOBAL REPORTING INITIATIVE GUIDELINES

The Global Reporting Initiative (GRI) was established in Boston in 1997 by the US non-profit organisations Coalition for Environmentally Responsible Economies and the Tellus Institute. The GRI has a partnership with the UN Global Compact, the UN Environment Programme, the Organisation for Economic Co-operation and Development, and various other similar initiatives (Global Reporting Initiative, 2013a; 2013b).

The GRI is a non-profit organisation that endorses environmental, social and economic sustainability by providing companies with guidelines for comprehensive disclosure on non-financial concerns. The GRI was created by means of a multi-stakeholder process by the GRI

secretariat. Although the guidelines are voluntary, there are many companies around the world which make use of it. This could imply that companies are aware of the need for integrated reports to be standardised and transparent for their stakeholders' use (Global Reporting Initiative, 2013a; 2013b; Kocmanova *et al.*, 2012:656; Gjølborg, 2009:14).

The aim of the GRI is to achieve a sustainable global economy through its reporting guidelines. A sustainable global economy encompasses companies' long-term financial performance with ESG and economic concerns. The GRI guidelines thus allow companies to quantify and disclose both ESG and economic performances. The guidelines assists companies in ensuring that their reports are transparent and standardised, and that companies are kept accountable. Transparent reporting by companies will build trust with stakeholders, which is necessary for companies to grow and to gain other benefits (Global Reporting Initiative, 2013a; Gasperini *et al.*, 2012:11; Ackers, 2009:6; Jenkins & Yakovleva, 2006:274; Hamman & De Cleene, 2005:132).

The GRI is voluntary and has been, and continues to be a key influence in standardising reporting and improving the transparency of ESG reports. Therefore companies which follow the GRI guidelines for reporting should produce higher quality reports than those that do not follow the GRI guidelines. Sonnenberg and Hamann (2006:311) stated that high-impact companies, such as the metal and mining companies, were more prone to use the GRI guidelines when compiling reports. The relationships and differences between these two variables were empirically tested by means of the following null hypotheses:

H_{0,13}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and subscribing to the GRI reporting guidelines.

H_{0,14}: There is no statistically significant difference between the extent of ESG reporting by JSE-listed companies subscribing to the GRI reporting guidelines and those who do not.

H_{0,15}: There is no statistically significant relationship between the extent of ESG reporting by international Metals and Mining companies and subscribing to the GRI reporting guidelines.

H_{0,16}: There is no statistically significant difference between the extent of ESG reporting by international Metals and Mining companies subscribing to the GRI reporting guidelines and those who do not.

3.7 BEING A PARTICIPANT OF THE UNITED NATIONS GLOBAL COMPACT

The UN Global Compact “is a strategic policy initiative for businesses that are committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption” (United Nations Global Compact, 2013a). Companies across the globe have begun to realise that there is a need for them to work in partnership with societies, labour, governments and the UN. By doing so, they can better manage the varying social, economic, governance, environmental and political challenges and opportunities they face (United Nations Global Compact, 2013a; Jenkins & Yakovleva, 2006:275).

According to the United Nations Global Compact (2013a; 2013b), the number of participants has grown to more than 10 000 since the compact was established in July 2000. This would indicate that companies understand the need for such partnerships. The UN Global Compact is a voluntary initiative that comprises non-government organisations, academia, UN organisations, labour unions and a great number of public and private companies. The UN Global Compact consists of tools and resources for management to use in a practical manner, to improve a company’s development, implementation and reporting of sustainability policies and practices (United Nations Global Compact, 2013a; Gjølborg, 2009:14).

The UN Global Compact offers companies a number of benefits by them becoming a participant. Such benefits include implementing reputable and recognised global policy guidelines for the development, implementation and reporting of ESG policies and practices. Companies can share information and knowledge about common problems and new practices with other companies or gain such knowledge or information from the UN. Partnerships with stakeholders can assist companies in improving their ESG management. Furthermore, the use of the tools and resources by companies constructed by the UN Global Compact should improve companies’ practices and reporting (United Nations Global Compact, 2013a; Hamman & De Cleene, 2005:132).

Being a participant of the UN Global Compact could, if properly used and adhered to, create a number of competitive and sustainable advantages for a company. As far as could be established, no academic studies have been conducted on the relationship between the extent of ESG reporting of the UN Global Compact participants in South Africa and in the metals

and mining industry globally. This study will address this gap in the body of knowledge. Based on the revealed gap, the resulting null hypotheses were empirically tested:

H_{0,17}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and being a UN Global Compact participant.

H_{0,18}: There is no statistically significant difference between the extent of ESG reporting by JSE-listed companies which are UN Global Compact participants and those who are not.

H_{0,19}: There is no statistically significant relationship between the extent of ESG reporting by international Metals and Mining companies and being a UN Global Compact participant.

H_{0,20}: There is no statistically significant difference between the extent of ESG reporting by international Metals and Mining companies which are UN Global Compact participants and those who are not.

3.8 FINANCIAL PERFORMANCE

Financial performance of a company was classified as being part of the micro business environment in Figure 3.1, where companies have the most control over their activities. This section is divided into two sub-sections, namely the types of financial performance measures and prior research in the relationship between financial and ESG performance. The ESG performance of a company should ideally be captured by a company's ESG report. The relationship between financial performance and ESG performance is ultimately the relationship between financial performance and ESG reporting (which was the dependent variable in this study). The types of financial performance measures used by academics will be discussed first.

3.8.1 Types of financial performance measures

Financial performance can be measured by means of accounting-based and market-based performance measures amongst others. Accounting-based performance measures indicate a company's internal efficiency in terms of decision-making, allocating and managing funds appropriately. These measures frequently comprise return on assets (ROA), return on equity (ROE), total asset turnover, and earnings per share (EPS) ratios (Ortas & Moneva, 2011:400;

Gentry & Shen, 2010:519; Wu, 2006:164; Orlitzky, Schmidt & Rynes, 2003:408). Equations 3.1 to 3.4 illustrate the equations for the four ratios ROA, ROE, total asset turnover and EPS respectively (Brigham & Daves, 2007:265).

$$ROA = \frac{\text{Operating Profit} + \text{Investment Income}}{\text{Average total assets}} \times \frac{100}{1} \dots\dots\dots (\text{Eq 3.1})$$

$$ROE = \frac{\text{Operating Profit} + \text{Investment Income} - \text{Finance Costs}}{\text{Average Shareholders' Equity}} \times \frac{100}{1} \dots\dots\dots (\text{Eq 3.2})$$

$$\text{Total asset turnover} = \frac{\text{Turnover}}{\text{Total assets}} \dots\dots\dots (\text{Eq 3.3})$$

$$EPS = \frac{\text{Attributable Earnings}}{\text{Average number of Ordinary Shares Issued}} \dots\dots\dots (\text{Eq 3.4})$$

The following researchers investigated the relationship between corporate social performance (CSP) and financial performance, using one or more of the above-mentioned accounting measures: López *et al.* (2007:290), Griffin and Mahon (1997:11) and Cochran and Wood (1984:46).

Market-based performance measures consist of financial ratios and the calculation of abnormal returns. Financial ratios such as holding period return (HPR) and market value to book value (M/B ratio) are typically used. These two ratios are classified as market-based performance measures since they incorporate some market measures, mainly share prices into the calculations (Gentry & Shen, 2010:519). The previous set of financial ratios use only accounting data from company financial reports. Equation 3.5 shows the HPR equation to calculate raw share returns, whereas Equation 3.6 depicts the M/B ratio (Brigham & Daves, 2007:265).

$$\text{Holding period return (HPR)} = \frac{(P_0 - P_1) + D_1}{P_0} \dots\dots\dots (\text{Eq 3.5})$$

Where:

- P_0 = Share price at the beginning of the holding period
- P_1 = Share price at the end of the holding period
- D_1 = Total dividend during the holding period

$$\text{Market value to Book value} = \frac{\text{Market value of equity}}{\text{Book value of equity}} \dots\dots\dots (\text{Eq 3.6})$$

Where:

Market value of equity = Preference share capital + market capitalisation of ordinary shares + minority interest

Book value of equity = Ordinary share capital + preference share capital + distributable reserves + non-distributable reserves + minority interest

The use of market-based measures enables decision-makers to evaluate a company's future financial performance (Van Breuden & Gössling, 2008:411; Orlitzky *et al.*, 2003:407). Researchers such as Baird *et al.* (2012:369) used these two financial ratios to test for corporate social performance.

Van Breuden and Gössling (2008:411) stated that market-based performance measures were the preferred measures of financial performance, as they were more closely related to shareholders' wealth, which was perceived as being the ultimate aim of management. According to Gentry and Shen (2010:517) and De Wet and Du Toit (2007:59), market-based performance measures integrated more relevant information into a company's financial performance than accounting-based measurements which were restricted to the internal performance of a company.

In contrast, Wu (2006:164) and other authors (such as Van Breuden & Gössling, 2008:411; López *et al.*, 2007:288; Griffin & Mahon, 1997:11) concluded that accounting-based performance measures were better indicators of a company's financial performance than market-based performance measures. However, Baird *et al.* (2012:368) claimed that accounting-based performance measures reflected the performance in the short-term and did not reflect the long-term effects company's CSP initiatives had on stakeholders' decision-making. Ullman (1985:549) on the other hand stated that accounting-based measurers concentrated on a longer time frame (medium to long-term) than market-based performance measures did (short-term).

In the South African context, De Wet and Du Toit (2007:64) analysed internal measures of corporate financial performance (CFP), specifically ROE and its impact on shareholders' return, separately and in conjunction with additional well-known financial accounting ratios,

such as economic value added, cash flow from operations, EPS, debt ratio and dividends per share. De Wet and Du Toit's (2007:67) results suggested that there was no correlation between shareholders' return and the CFP (accounting-based measures) studied.

Griffin and Mahon (1997:7, 11) chose to use accounting-based measures rather than market-based measures, as market-based measures were seen to be assessing more than the financial outcome of a company. These researchers excluded market influences on a company's financial performance by selecting accounting-based measures only. The purpose of their study was to extend research already conducted on the relationship between CSP and CFP with emphasis on methodological inconsistencies that have been identified in previous studies. The chemical industry was the only industry chosen for empirical analysis as the authors claimed that this would contribute to the validity of the results. Griffin and Mahon (1997:22) found that within a specific industry, there was a positive relationship between CSP and CFP (accounting-based) over time.

It had been suggested that when multiple industries were focused on, the relationship between CSP and CFP was hidden as a result. The researcher concludes that this suggestion lends support to the focus of the present study partly, as one of the two samples used was a single industry. Prior research on the relationship between financial and ESG performance will be reviewed in the following section.

3.8.2 Findings on the relationship between financial and ESG performance

Inconsistent results have been found in studies on CFP and companies' CSR activities. CSR activities could be seen as a proxy for ESG management (Baird *et al.*, 2012:368; Vives & Wadhwa, 2012:7). Many studies have used a meta-analysis method in an attempt to determine relationships between variables where previous studies have found inconsistent results (Wu, 2006:168; Orlitzky *et al.*, 2003:404). The majority of the studies reviewed observed a positive relationship between CSP and CFP (Roman, Hayibor & Agle, 1999:113; Griffin & Mahon, 1997:8).

Van Breuden and Gössling (2008:408) and others (such as Moneva & Ortas, 2010:195; Peiris & Evans, 2010:105; Griffin & Mahon, 1997:22; Cochran & Wood, 1984:54) reported a positive relationship between the level of social responsibility and financial performance. A positive relationship indicates that companies which are performing well in a CSP capacity

are also performing well financially (Baird *et al.*, 2012:367; Van Breuden & Gössling, 2008:407). In Orlitzky *et al.* (2003:411) financial performance was generally defined as a company's financial feasibility and the achievement of set economic goals.

Accounting and market-based performance measures were used in the studies where a positive relationship was recognised (Van Breuden & Gössling, 2008:412; Wu, 2006:164; Orlitzky *et al.*, 2003:417; Cochran & Wood, 1984:45). Only accounting-based performance measures were used by Griffin and Mahon (1997:11). In Baird *et al.* (2012:368) a negative relationship was found between CSP and CFP. Accounting and market-based performance measures were used to determine the financial performance of companies in their study.

Some studies have discussed reasons behind the inconsistent findings and argued that they were related to a lack of consensus on the most appropriate financial performance measurements, varying methodologies used, inappropriate sampling methods, different geographic areas, and different time frames of studies (Baird *et al.*, 2012:368; Ortas & Moneva, 2011: 399; Moneva & Ortas, 2010:195; Van Breuden & Gössling, 2008:410; Griffin & Mahon, 1997; Ullman, 1985:545; Cochran & Wood, 1984:44).

A positive relationship between CSP and CFP could relate to other relationships as well, such as more profitable companies perhaps having better ESG disclosure. It has been suggested that companies which are more profitable have more resources to produce better quality financial and non-financial reports than lower performing companies (Brammer & Pavelin, 2008:125 Aerts *et al.*, 2006:303; Jenkins & Yakovleva, 2006:275).

According to Wingard and Vorster (2001:327), a positive relationship existed between environmental reporting and CFP of South African companies studied, in which accounting-based performance measures were used. They furthermore found that those companies with greater environmental responsibility did not achieve better financial performance than companies with less environmental responsibility.

It is expected from this study and others reviewed, that companies that perform better financially will produce better ESG reports. However, to empirically investigate the relationship between the extent of ESG reporting and financial performance, the following null hypotheses were formulated:

H_{0,21}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and accounting-based financial performance.

H_{0,22}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and market-based financial performance.

H_{0,23}: There is no statistically significant relationship between the extent of ESG reporting by international Metals and Mining companies and accounting-based financial performance.

H_{0,24}: There is no statistically significant relationship between the extent of ESG reporting by international Metals and Mining companies and market-based financial performance.

3.9 COMPANY SIZE

Literature suggests that larger companies tend to disclose more ESG information and therefore, produce higher quality reports than smaller companies (Brammer & Pavelin, 2008:124). However, Halme and Huse (1997:153) discovered that even though larger companies provided more environmental information than smaller ones, the quality of the information reported was lower. Taking into account Halme and Huse's claim, it still stands that larger companies have a bigger impact on the social, environmental and economic environment in which their business is conducted. The larger impact therefore, tends to attract more public attention, which in turn calls for better reporting (Brammer & Pavelin, 2008:124; Aerts *et al.*, 2006:303).

In De Villiers and Barnard's (2000:21) study on environmental reporting in South Africa, the higher disclosure rate on environmental concerns among metals and mining companies was attributed to the size of mining companies in comparison to industrial companies. According to De Villiers and Barnard (2000:21) and Sonnenberg and Hamann (2006:313), larger companies tend to disclose more information on environmental considerations than smaller companies do.

Company size has been measured differently in previous studies, in that some authors have used a natural logarithm of total assets (Brammer & Pavelin, 2008:129; Aerts *et al.*, 2006:315; Griffin & Mahon, 1997:17), while others used a combination of total assets, number of employees and total sales (Wu, 2006:165). Hackston and Milne (1996:87)

identified similar methods for determining company size to the researchers previously mentioned, but in their study they chose to use market capitalisation as a measure of company size. Their reasoning was that there was no theoretical reasons for any particular measurement to be used, therefore, why not use it in conjunction with other measures.

Brammer and Pavelin (2008:121) found that larger companies were studied more frequently as they are viewed as disclosing more ESG information. Based on the literature, it was expected that larger companies would produce better ESG reports than smaller companies. However, to empirically investigate this assumption, the subsequent null hypotheses were formulated:

H_{0,25}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and company size.

H_{0,26}: There is no statistically significant relationship between the extent of ESG reporting by international Metals and Mining companies and company size.

The following factor to be discussed which was identified as an influencing factor of ESG reporting is board composition. As with company size, board composition is also classified into the micro business environment in Figure 3.1. As with the other factors in this environment, companies have the greater level of control over these factors.

3.10 BOARD COMPOSITION

Board composition was discovered to be a factor which influences the level of disclosure by companies (Halme & Huse, 1997:138). This is due to boards managing what and how much information should be disclosed. Boards of directors are influenced by corporate governance frameworks of a country when deciding what and how much information to disclose. It is up to the board to ensure that a company's actions are in the best interest of all stakeholders (Brammer & Pavelin, 2008:125; Haniffa & Cooke, 2002:318).

Non-executive directors (NEDs) were found to have a greater influence and more expectations of a company's level of disclosure (Haniffa & Cooke, 2002:320). This is owing to NEDs' interests being more closely related to stakeholders' interests than those of the management of a company (Brammer & Pavelin, 2008:125). Different countries often have

varying acts of legislation regarding the composition of a board of directors (Halme & Huse, 1997:142).

In South Africa the JSE Listings Requirements (based on King III report and the Companies Act (No. 71 of 2008)) places the responsibility of providing adequate information and being transparent to all stakeholders through reporting on company boards (Institute of Directors in Southern Africa. 2013). According to King III, a board of directors should consist mostly of independent NEDs (Institute of Directors in Southern Africa, 2009a:31; 2009b:30).

A minimum requirement set by King III regarding a company's board of directors is that there should be two executive directors, namely the chief executive officer and a finance director, appointed to the board. This will assist management in ensuring more direct contact between management and the board of directors (Institute of Directors in Southern Africa, 2009a:33; 2009b:31). Boards should ensure that there is a balance of power within the board and that no one individual or group of individuals has power to control the decision-making by the board (Institute of Directors in Southern Africa, 2009a:31; 2009b:30).

King III suggests that boards of directors should ensure that their company conducts positive business operations in terms of the company's triple bottom line. Boards are required to supply forecast information to all stakeholders. The board should ensure that this information is reliable and qualitative (Gasparini *et al.*, 2012:10; Institute of Directors in Southern Africa, 2009a:15). According to King III, companies in South Africa should be "governed by a unified board with a Chief Executive Officer and a separate chairman", the chairman should however, be an independent NED (Gstraunthaler, 2010:147). Should a board appoint a chairperson who is a NED but is not independent, the reason and justification for appointing such person should be disclosed in the integrated report (Institute of Directors in Southern Africa, 2009a:27; 2009b:32).

Brammer and Pavelin (2008:131) and Halme and Huse (1997:152) established that board composition has no significant impact on the extent of environmental reporting by companies. Ntim and Soobaroyen (2012:14) conducted their study on the influence of board composition and ownership on BEE disclosure by South African JSE-listed companies for 2003 to 2009. It was found that there was a statistically significant influence on BEE disclosure by diverse, more NEDs and large boards.

In light of the above, it seems that board composition may represent a variable which could influence the extent ESG reporting among listed companies. Therefore, a null hypothesis was constructed, namely:

H_{0,27}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and the composition of the companies' board of directors.

There is no null hypothesis for the international Metals and Mining companies as there was no data available to the researcher for this sample.

3.11 OWNERSHIP CONCENTRATION

The final variable that has been identified in the literature as potentially influencing the extent of ESG reporting is that of ownership concentration. As with the previous factors influencing ESG reporting, companies have an extensive level of control over this factor in their micro business environment (Figure 3.1). It has been suggested that the greater the concentration of ownership, the more pressure is placed on companies to produce detailed environmental reports (Brammer & Pavelin, 2008:124).

In most countries, reporting on ESG issues is voluntary, therefore smaller ownership concentration means that investors rely heavily on companies to follow the voluntary frameworks, as they have less influence over companies (Brammer & Pavelin, 2008:124; Aerts *et al.*, 2006:302; Halme & Huse, 1997:141).

Brammer and Pavelin (2008:131) and Halme and Huse (1997:152) discovered that there was no significant relationship between ownership concentration and company disclosure. The researchers' results indicated that companies disclosed on environmental concerns, but they were not of the best quality. In contrast, Cullen and Christopher (2002:52) observed a significant association between non-financial reporting and ownership concentration.

According to Graham and Uliana (2001:7), South Africa is a unique market because of its distinguishing characteristics which have come about from its history, the country's natural resources, and its ownership concentration. In Gstraunthaler's (2010:147) study on corporate governance in South Africa, it was stated that there were a small number of dominant conglomerates with high levels of ownership and cross-shareholding in the early 1990s that

were controlled by the JSE. Shares were held then by a number of wealthy families. However, this has changed post-1994, and institutional investors are now majority shareholders in most companies. Public ownership of a company as opposed to family ownership has been claimed to lead to more pressure on companies to disclose information on ESG issues (Umlas, 2008:1025).

Institutional investors require more information from companies regarding factors such as ESG concerns, as these have an influence on their decision-making process (US Social Investment Forum, 2010; Umlas, 2008:1021). This could mean that if ownership concentration is spread more across institutional investors, reporting on ESG considerations should be higher than when companies were generally owned by wealthy families. According to Ntim and Soobaroyen (2012:14) ownership concentration has an influence on BEE disclosure. Specifically it was found that block ownership and institutional ownership reduce BEE disclosure.

For this study, ownership may pose as an interesting variable to investigate further as an influence on companies' ESG reporting; therefore the resulting null hypotheses were prepared:

H_{0,28}: There is no statistically significant relationship between the extent of ESG reporting by JSE-listed companies and the level of ownership concentration.

H_{0,29}: There is no statistically significant relationship between the extent of ESG reporting by international Metals and Mining companies and the level of ownership concentration.

3.12 SUMMARY AND CONCLUSIONS

In this chapter a theoretical framework of all the factors that could influence the extent of ESG reporting was developed. Table 3.2 provides a summary of these factors and the associated null hypotheses that were empirically tested.

Table 3.2: Independent variables based on the theoretical model

Business Environment	Independent variables	Relevant hypotheses to be tested
Macro	Inclusion in an RI index	$H_{0,1} - H_{0,6}$
	Legal system in a country	$H_{0,7} - H_{0,8}$
	Country status	$H_{0,9} - H_{0,10}$
Market	Industry	$H_{0,11} - H_{0,12}$
Micro	Use of GRI guidelines	$H_{0,13} - H_{0,16}$
	Being a participant of the UN Global Compact	$H_{0,17} - H_{0,20}$
	Financial performance	$H_{0,21} - H_{0,24}$
	Company size	$H_{0,25} - H_{0,26}$
	Board composition	$H_{0,27}$
	Ownership concentration	$H_{0,28} - H_{0,29}$

This chapter on the factors influencing ESG reporting makes a significant contribution to the body of knowledge in this field. As stated in Section 1.3, there has been limited academic research on environmental, social and corporate governance reporting, and the factors which could influence reporting. In the following chapter the research design and methodology of the study will be discussed in detail.

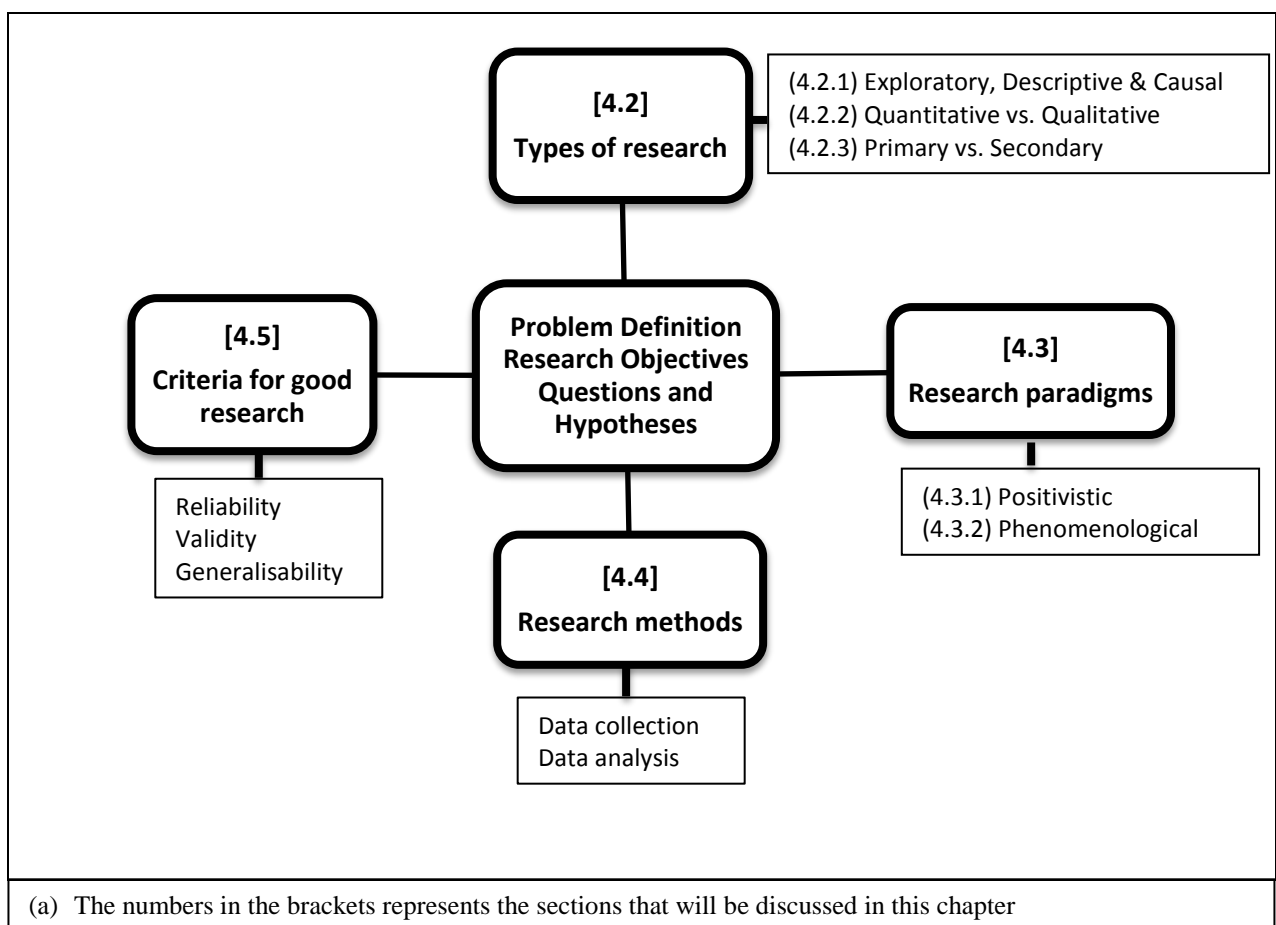
CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

In the previous chapter the factors that could potentially influence the extent of ESG reporting by listed companies in South Africa and companies in the international metals and mining sector were identified and discussed in depth. These factors were classified as the independent variables for this study. The purpose of this chapter is to discuss the research design, methodology and methods used in this research. Figure 4.1 provides the research design applied in this study.

Figure 4.1: Research design framework^(a)



Source: Adapted from Viviers (2007:39)

From Figure 4.1 it can be seen that the problem definition, the research objectives, research questions and hypotheses are fundamental to the research design as these help the researcher in establishing what type of research will be used, what the most appropriate research paradigm will be, and what type of research methods will be used to collect and analyse data. In this chapter, the research design, the research paradigms and the research methods will first be presented. This will be followed by a discussion on the data collection and analysis, as well as criteria for good research.

4.2 RESEARCH DESIGN

Research design is defined as a guideline for the researcher, which states the methods to be used for the collection and analysis of data that is required for the study (Zikmund & Babin, 2010:64). Hair *et al.* (2007:151) likewise defined research design as a means of providing direction to the researcher, in terms of selecting a design method. The research methods chosen will be used to collect and analyse relevant data to answer the researcher's questions and test the formulated hypotheses of the study.

4.2.1 Types of research

As indicated in Figure 4.1, a distinction is made between three types of research, namely exploratory, descriptive and causal research. Exploratory research is best used when the researcher has little knowledge about a topic, needs clarification, and wishes to discover new ideas (Struwig & Stead, 2007:7). According to Kumar, Aaker and Day (2002:69), exploratory research is usually the first step in research and it is expected from the exploratory research findings that more research will be conducted on a topic.

Descriptive research is used when the researcher requires data to describe the characteristics of the topic, people or companies (Hair *et al.*, 2007:155). In contrast to exploratory research, descriptive research is performed only once the researcher has a firm understanding of the topic being studied (Kumar *et al.*, 2002:70).

Causal research allows the researcher to test if one event causes another, and inferences can be made (Coldwell & Herbst, 2004:11). Zikmund *et al.* (2013:55) stated that the three types of research are building blocks in that exploratory research provides the foundation for descriptive research, which can lead the researcher to conducting causal research if necessary.

Descriptive and causal research designs are aimed at testing hypotheses, unlike exploratory research (Hair *et al.*, 2007:154). According to Zikmund and Babin (2010:65), there is no one best research design, and a researcher will select the research designs that will best fit with the research objectives of the study. Depending on how well-researched a topic already is will have an influence on the type of research conducted. The nature of this study was descriptive because will use data to describe characteristics of ESG reporting.

4.2.2 Quantitative versus qualitative research

As discussed in the previous section, no one research design is better than another; the choice simply lies with determining which is better suited to a researcher's study. The same applies to the debate about quantitative versus qualitative research and the answer remains the same; the researcher will select the type of research design that is best applicable to the researcher's needs (Zikmund *et al.*, 2013:133).

Quantitative research is defined as research which aims to attend to the research objectives by empirically assessing observations with numerical measurements and analysis (Cooper & Schindler, 2011:163). Qualitative research is referred to as research which uses techniques from which researchers can elaborate on interpretations of what is being studied without relying on numerical measurements (Struwig & Stead, 2007:243).

In quantitative research, a significant amount of activity is directed towards using scales to measure concepts, which provide either direct or indirect numerical values. From the numerical values, statistical tests can be conducted and hypotheses tested. This is a contrast to qualitative research which involves observations, listening, and interpretations (Blumberg *et al.*, 2011:144).

Qualitative research is far less structured than quantitative research, as it is researcher-dependent. This means that it is up to the researcher to extract meanings from unstructured responses, such as the script from recorded interviews, and be able to change it into information. Topics which are not well established usually lead the researcher to use a qualitative research. This allows the researcher to expand on the topic more than can be done with quantitative research methods (Cooper & Schindler, 2011:160; Hair *et al.*, 2007:151). In the present study, quantitative research was used. This decision was based upon the research objectives constructed in Section 1.4.

4.2.3 Primary versus secondary research

Primary research is used when data are new and are collected for the sole purpose of the study. Primary research can be completed with the use of surveys, case studies, interviews or observations (Zikmund *et al.*, 2013:141). In the case of surveys, respondents can complete them themselves or an interviewer can complete them on behalf of the respondents (Hair *et al.*, 2007:192).

Secondary research, on the other hand, refers to data that already exist from a different source from the study being conducted (Blumberg *et al.*, 2011:151). In this study, only secondary research was used, as it was the most applicable for answering the research questions. In addition, secondary research suited the data available to the researcher.

A number of advantages and disadvantages exist when using secondary research. One advantage is the availability of the data, as it can be collected quickly as it is drawn together prior to collection. It is more readily available than primary data, as it does not involve contact being made with respondents (Bryman & Bell, 2007:328). Further advantages include: the capacity for evaluating data prior to use; greater potential for comparative analysis to be conducted; and potential for triangulation of data, as well as new insights to be gained (Hair *et al.*, 2007:128).

However, there is a disadvantage to using secondary data which is that the data are not designed and collected in a way that meets a researcher's specific objectives. This may create problems when the reliability, validity and usefulness of the data are considered. Four such reasons exist namely: data may be out-dated; the definition of concepts may vary; the measurement units may be different; and there may not be enough information available for the researcher to verify the accuracy of the data (Zikmund & Babin, 2010:164-165).

As stated previously, this study will only use secondary research. Based on the disadvantages of secondary research discussed, the researcher notes that this study will be subjected to some of these disadvantages. The first disadvantage was that the researcher did not collect the data directly, and therefore the reliability and validity of the data were a concern. The second disadvantage experienced by the researcher was that there was inadequate data available for certain aspects of the study, such as the financial data availability for all the companies in the samples. This was a factor over which the researcher had limited control.

The researcher overcame these disadvantages by examining the MSCI ESG Research's and Bureau van Dijk's methodologies regarding how the data were gathered, calculated and presented. This assisted the researcher in ensuring that the data from the companies' perspective were valid and reliable. For the second disadvantage identified, the researcher attempted to gather as much additional data as possible to overcome this disadvantage. However, where necessary data could not be found, the sample size was affected, as only complete company data were used.

4.3 RESEARCH PARADIGMS

There are two types of research paradigms available to researchers, namely positivistic and phenomenological. A researcher will select a methodology best suited for the study. A researcher may use one or both paradigms. Research paradigm is synonymous with research methodology.

4.3.1 A positivistic research methodology

A positivistic research paradigm is a deductive approach which uses quantitative data (Blumberg *et al.*, 2011:17). A deductive approach entails starting from a broad theory topic to a specific point or conclusion based on hypotheses that were formulated and tested. A positivistic research paradigm is described as a conclusive research methodology with a large representation of the population chosen. Structured empirical processes for data collection and analysis are used to address the research objectives and questions in quantitative research. This research methodology is mainly associated with descriptive and causal research designs (Trochim, 2006; Struwig & Stead, 2007:4-5). Positivistic research uses numerical measurements and analysis methods (Zikmund & Babin, 2010:133).

4.3.2 A phenomenological research methodology

A phenomenological research paradigm is an inductive approach which uses qualitative data. This paradigm is not as structured as a positivistic methodology, and is used in subjective fields of study such as philosophy, psychology and sociology. Phenomenological research is characterised by texts, interpretations and observations. This research methodology is associated with an exploratory research design and allows researchers to interpret and explain

occurrences observed in market places, and small samples, without the use of any numerical measurement required (Zikmund & Babin, 2010:131, 136; Struwig & Stead, 2007:11-16).

4.3.3 Research methodology adopted for this study

A positivistic research methodology was adopted for this study, as it allowed the researcher to collect and analyse secondary quantitative data. It furthermore allowed the researcher to test the stated research hypotheses. As can be seen in Table 4.1, there are a number of differences between a positivistic and a phenomenological research methodology. The information in Table 4.1 helped the researcher to adopt a positivistic research methodology as opposed to a phenomenological research methodology.

Table 4.1: The differences between positivistic and phenomenological paradigms

Positivistic (Quantitative)	Phenomenological (Qualitative)
Useful for testing hypotheses	Useful for making discoveries
Summarises information on many characteristics	In-depth information on a few characteristics
Useful in tracking trends	Discovers motivations and values which are not visible
Structured data collection methods and objective ratings	Unstructured data collection methods and requires subjective interpretation
Representativeness is a high concern	Representativeness is less of a concern
Achieving reliability and validity of measurement used is important	Trustworthiness of respondents is important
Large samples used (over 50)	Small samples used (1-50)
Results are relatively objective	Results are relatively subjective

Source: Adopted from Hair *et al.* (2007:152)

From Table 4.1, it can be seen that a positivistic paradigm involves greater quantities of data than phenomenological paradigms. It can also be noted that with positivistic approaches, the researcher can normally generalise the results to greater populations, whereas in phenomenological approaches, the samples are too small to be able to be generalised to a larger population (Struwig & Stead, 2007:5). One of the most important differences between positivistic and phenomenological approaches is their usefulness. Testing hypotheses and making discoveries will clearly influence which paradigm is chosen for a study (Hair *et al.*, 2007:152). The research methodology chosen by the researcher influenced the selection of the research methods used in this study. The research methods will be discussed in the next section.

4.4 RESEARCH METHODS

In positivistic and phenomenological research methodologies, there are a number of research methods which can be used depending on the type of data that are required to answer the research questions. Data collection, editing, coding, and analysis will be defined here in more detail for both paradigms.

Data collection broadly involves the process of gathering data required for a study, and can be conducted once the sampling plan has been established (Cooper & Schindler, 2011:89). The method of data collection will differ between positivistic and phenomenological research paradigms. Once data has been collected, it is necessary to edit and code it to ensure that it is complete and valid (Hair *et al.*, 2007:304). Editing of raw data is the procedure of checking for inconsistencies or incompleteness, and preparing the data to be coded by the researcher (Zikmund *et al.*, 2010:463).

If the researcher detects problems in the raw data and is able to make adjustments, he or she should take cautious steps to render data more complete and consistent (Zikmund & Babin, 2010:493). When data are missing, the researcher should identify and resolve the problem, as missing data affect the validity of the results (Hair *et al.*, 2007:305). Coding and data analysis will be different for quantitative and qualitative data and therefore will be discussed in the specific sections.

In the next sections, the research methods that can be used in positivistic and phenomenological studies will be presented. The research methods used in this study for data collection and analysis will also be discussed.

4.4.1 Data collection and analysis in positivistic studies

Quantitative primary and secondary data can be gathered in a number of ways. The most commonly used primary data collection methods involve questionnaires in various forms (personal interviews, telephone surveys, mail surveys) or direct observation of subjects. Secondary data can be collected from three different types of sources, namely raw data which were collected previously (for example a company database), a summary of numbers (for example statistics on a country) or from written articles or theses (Struwig & Stead, 2007:80, 86-97).

In positivistic studies, coding is defined as the procedure of allocating a numerical score or sign to the already edited data to provide it with more meaning before data analysis can be conducted (Cooper & Schindler, 2011:405). Data analysis is the process of taking collected, edited and coded data, and making it more understandable by applying statistics to it so that descriptions or interpretations can be made from it (Blumberg *et al.*, 2011:59). The data analysis techniques used in a study will be influenced by the research design decided upon, the information required by the researcher, and the type of data that is collected (Zikmund & Babin, 2010:66).

Data analysis on quantitative data can be conducted by the use of descriptive and inferential statistics, because phenomena in quantitative data are given numerical measurements during the coding phase (Zikmund *et al.*, 2013:135). However, before data analysis with statistical measures can be conducted, an understanding of the different levels of measurement needs to be gained, as each level has an appropriate statistic(s) that can be used. There are four different levels of measurement. The first two are nominal and ordinal scales which include categorical or discrete measurement levels. The last two levels of measurement are interval and ratio scales, which are continuous measurement levels (Struwig & Stead, 2007:153).

Nominal scales allow data to be classified into categories which have no particular order. Categories are labelled with a number which cannot be used to determine any arithmetic result. The most appropriate measure of central tendency that can be used for nominal data is 'mode'. To test hypotheses with nominal data, chi square tests are the most common test (Coldwell & Herbst, 2004:63-64).

Ordinal scales are similar to nominal scales except that ordinal scales give order to the categories in the form of depicting that one item is greater than another. Ordinal scales can also demonstrate more interest in one item than another. Median is an appropriate measure of central tendency for ordinal data, as numbers are used in ordinal scales to provide a rank order to the data. With ordinal data, it has been found that non-parametric methods for statistical analysis are better suited. Correlation analysis techniques such as Spearman's rank-order correlation and Kendall's coefficient of concordance are two such methods (Cooper & Schindler, 2011:276; Coldwell & Herbst, 2004:64).

Interval scales have the capability of both nominal and ordinal scales with the additional forte of incorporating the concept equality of interval into the scale. Interval data are generally

symmetric, and therefore the mean as a measure of central tendency and the standard deviation, a measure of dispersion, can be used. In terms of inferential statistical methods that can be used for interval data are product-moment correlation, *t*-tests, *f*-tests and various other parametric tests (Cooper & Schindler, 2011:276-277).

The last level of measure is ratio scales, which are the most advanced measurement because they have the basis of an interval scale composed with a fixed origin or zero point. With ratio scales, researchers can compare differences and the relative magnitude of scores. Due to the nature of ratio data, all available statistical methods can be used with this type of scale (Cooper & Schindler, 2011:277; Coldwell & Herbst, 2004:66).

According to Struwig and Stead (2007:156), the level of measurement should be given thought, because the nature of the data will determine which descriptive and inferential statistical methods can be used. Certain statistical methods can only be applied to data when they are in a specific format. The above discussion on data collection and analysis in positivistic studies leads the researcher to present a theoretical introduction to descriptive and inferential statistics in subsequent sections.

4.4.1.1 Descriptive statistics

Descriptive statistics can be defined as statistics which provide a clear summary and description of data in the form of measures of central tendency, measures of dispersion, and measures of shape. Descriptive statistics assist researchers in summarising large quantities of data into simple statistics for interpretation (Zikmund & Babin, 2010:516). The various descriptive statistics in each measure will be defined and discussed.

Measures of central tendency consist of the mode, mean and median. First, the mode identifies the value which occurs the most often in the sample distribution, and is the better measure when the data are less than interval. The mean is defined as the arithmetic average of the sample distribution, and is the most widely used measure of central tendency in academic research (Swift & Piff, 2010:276-278).

There are a few advantages and disadvantages associated with the mean. The advantages are that average is an easily understood concept; the means of a number of data sets are comparable; a mean can be acquired for any type of data set; and it includes all the data in the

set. The disadvantages are that extreme values can alter the results even if the values are not representative of the whole data set; large data sets can be tedious to calculate the mean, and a mean cannot be calculated for open-ended classes at either end of a scale (Coldwell & Herbst, 2004:110). The formula for calculating the arithmetic sample mean ($\bar{\chi}$) is (Weiers, 2011:59):

$$\bar{\chi} = \frac{\sum \chi_i}{n} \dots\dots\dots (\text{Eq 4.1})$$

Where:

$\sum \chi_i$ = The i th data value in the sample
 n = Number of observations

Next, median is the value which is in the middle of the sample distribution, often referred to as the 50th percentile, and is a preferred indicator of central tendency when there are outliers (Swift & Piff, 2010:277).

Measures of dispersion comprise range, variance, and standard deviation. Range is defined as the spread of the data, and is the distance between the largest and smallest values of a sample frequency distribution. Variance is said to measure variability or dispersion, by determining the distance between the observation and the mean, by calculating the deviation scores for each observation (Swift & Piff, 2010:282-283). The formula for calculating the sample variance (s^2) is (Weiers, 2011:73):

$$s^2 = \frac{\sum (\chi_i - \bar{\chi})^2}{n-1} \dots\dots\dots (\text{Eq 4.2})$$

Where:

χ_i = The i th data value in the sample
 $\bar{\chi}$ = The sample mean
 $\sum (\chi_i - \bar{\chi})^2$ = The sum of the squared i th data less the sample mean
 n = Number of observations

Finally, standard deviation is the spread or variability of the sample distribution values from the mean, and is considered the most valued index of dispersion (Hair *et al.*, 2007:319-320). This measure of central dispersion is considered one of the most frequently used as it enhances interpretability, as the variance square is removed and conveys deviations in their

original units (Cooper & Schindler, 2011:426). The sample standard deviation (s) formula is (Anderson, Sweeney & Williams, 2011:100):

$$s = \sqrt{s^2} \dots\dots\dots (\text{Eq 4.3})$$

The last descriptive statistical form is measures of shape, which include skewness and kurtosis. Specifically, skewness is defined as the measure of deviation from symmetry that exists. Symmetrical distributions show that the mean, mode and median appear in the same location. This will lead a study to use parametric tests. However, if a distribution is asymmetrical it is called *skewed*. This means the distribution is either leaning towards one tail (positive or right skewed) or the other (negative or left skewed). A symmetrical distribution sk will be approximately 0, whereas positive sk will have a positive value and negative sk will have a negative value (Cooper & Schindler, 2011:427; Struwig & Stead, 2007:159). The equations for skewness (sk) and kurtosis (ku) are as follows (Kirk, 2008:112, 114):

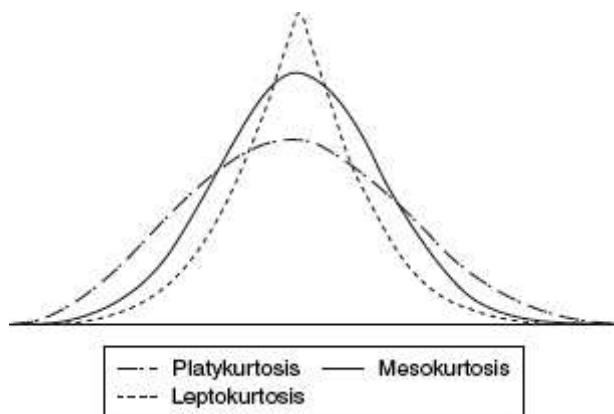
$$sk = \frac{\frac{\sum(x_i - \bar{x})^3}{n}}{s^3} \dots\dots\dots (\text{Eq 4.4})$$

$$ku = \frac{\frac{\sum(x_i - \bar{x})^4}{n}}{s^4} \dots\dots\dots (\text{Eq 4.5})$$

Where:

x_i	=	The i th data value in the sample
\bar{x}	=	The sample mean
s	=	Sample standard deviation
n	=	Number of observations

Kurtosis graphically depicts ‘the shape of the distribution of scores’ (Cooper & Schindler, 2011:427). Kurtosis measures the flatness or peakedness of the distribution. Figure 4.2 depicts the outcomes of the kurtosis tests.

Figure 4.2: Measure of shape: Kurtosis

Source: Taylor (2008:581)

When a distribution has observations which cluster heavily or pile up in the centre, it is called peaked (leptokurtic). When observations are more evenly distributed and have flatter tails, this is called flat distributions (platykurtic). Observations which are not too peaked or too flat are considered intermediate (mesokurtic) distributions. A normal distribution ku (mesokurtic) will be approximately 0, whereas leptokurtic distribution will have a positive number and platykurtic distributions will have a negative number (Cooper & Schindler, 2011:427; Struwig & Stead, 2007:159).

According to Gravetter and Wallnau (2013:95), researchers should apply all three tests to a data set as they are testing for similar things and therefore, are related to some degree. The symmetry or shape of distributions was discussed previously. Gravetter and Wallnau (2013:95) suggested that the three measures of central tendency can also be used to determine a distributions' symmetry or skewness. If a distribution is perfectly symmetrical, the mean and median will have the same values. The mean and median values will be close to each other when a distribution is almost symmetrical. Only when symmetrical distributions have one mode, will it be found that it is the same as the mean and median. For data sets which are skewed, the mean, median and mode will not present the same values (Gravetter & Wallnau, 2013:95).

A discussion about the descriptive statistics which were used in this study will be provided in Section 4.4.4. In the next section, more detail on inferential statistics will be given.

4.4.1.2 Inferential statistics

Inferential statistics refer to statistics used to project the general characteristics from a sample to a population. Inferential statistics rely on different tests depending on what is to be tested (Struwig & Stead, 2007:159). According to Coldwell and Herbst (2004:110), inferential statistics can also be used to test hypotheses from data collected from the sample to test for relationships or differences in the population.

Statistical testing for significance should take place in the following order (Cooper & Schindler, 2011:462):

- *State the null hypothesis*: even though a researcher wishes to test a hypothesis of change or differences, the null hypothesis needs to be stated because it is used in statistical testing.
- *Choose the statistical technique*: to test a hypothesis, an appropriate test needs to be selected. There are criteria which can be used when deciding on a specific test. First, the power efficiency of a test should be considered, as the more powerful the test, the better the outcomes on smaller samples than less powerful tests. Next, the nature of the sample drawn and population, as some tests require the population to have particular characteristics. And lastly, the measurement scale will influence which test can be used.
- *Select the level of significance*: before data are collected, the researcher should decide on the level of significance.
- *Compute the calculated difference value*: once the data are collected, the chosen statistical tests can be conducted to obtain the calculated results.
- *Obtain the critical test value*: after the computed values have been calculated, the critical value should be obtained from the appropriate table for the distribution. The critical value is then used as the criterion that defines the acceptance or rejection region for the null hypothesis. Computer programmes generally provide the critical value with the results.
- *Interpret the test*: generally when the calculated value is greater than the critical value, a researcher will reject the null hypothesis. The opposite holds too, that should the calculated value be less than the critical value, the researcher will fail to reject the null hypothesis.

A hypothesis is described as “a statement about aspects of the real world that may be true or false” (Coldwell & Herbst, 2004:110). Two types of hypotheses exist, namely the null

hypothesis and the alternative hypothesis. The null hypothesis is the one that researchers use to test for significance. For hypotheses to be tested, they must appear in a form that is testable, with the use of techniques and methods available to researchers. Hypotheses cannot be proven to be true, however, through statistical tests, researchers can reject or fail to reject the hypothesis tested (Cooper & Schindler, 2011:456; Coldwell & Herbst, 2004:110). The hypotheses for this study were provided in Chapter Three under each literature section and summarised in Table 3.2.

For a researcher to ascertain whether a hypothesis can be rejected, it will depend on the pre-determined criterion set at the start of a research study. This pre-determined criterion is known as the significance level, or alpha level (α). The significance level (α) is the “critical probability associated with a statistical hypothesis test that indicates how likely an inference supporting a difference between an observed value and some statistical expectation is true” (Zikmund & Babin, 2010:541). Generally a significance level of 0.05 or 0.1 are used by researchers to assist in determining whether the hypothesis is a reject or fail to reject conclusion (Coldwell & Herbst, 2004:111). For the present study a significant level (α) of 0.05 was set at the start of the research.

There is an alternative method of presenting the statistical results for a researcher to evaluate the null hypothesis other than the rejection region established by the critical value. This alternate method is statistical results presented as probability values (p -values) (Cooper & Schindler, 2011:462). The p -value is the “probability that such an extreme test statistic occurs” (Swift & Piff, 2010:495). The p -value is a very good way to establish the credibility of data (Wonnacott & Wonnacott, 1990:294). Once the p -value is calculated, it can be compared to the significance level (α). From the comparison, the researcher can conclude whether the null hypothesis should be rejected ($p\text{-value} < \alpha$), or not ($p\text{-value} > \alpha$) (Zikmund *et al.*, 2013:510).

A number of different statistical tests are available to researchers, and two general classes exist of significant tests, namely parametric and non-parametric tests. According to Cooper and Schindler (2011:464), parametric tests are considered more powerful because the data originate from interval and ratio measurements, while non-parametric are used to test hypotheses with nominal and ordinal data. Non-parametric tests are also used when a sample is less than 30 (Weiers, 2011:318).

There are a number of assumptions that have to be met to use parametric statistics for data analysis. The assumptions are as follows: observations are required to be independent, in other words, “the selection of any one case should not affect the chances for another case to be included”; a sample must be taken from a normally distributed population; the samples should have equal variances; the level of measurement scale should be interval or ratio; and lastly the score distributions should be symmetric (Struwig & Stead, 2007:160; Coldwell & Herbst, 2004:113).

Should these assumptions for parametric statistical tests not be met, then non-parametric statistical tests should rather be considered. The assumptions for non-parametric statistics are the following: observations should be independent, unless a dependent or matched sample is used; sample sizes are very small; variances for each group of scores are statistically significantly different from each other; or lastly the score distributions are excessively asymmetrical (Struwig & Stead, 2007:165; Coldwell & Herbst, 2004:113).

For researchers to determine which statistical test to use in a study there are a number of questions to consider. Such questions may be the following: How many samples does the test involve? Are the cases related or independent? And what is the measurement scale? (Cooper & Schindler, 2011:466). According to Howell (1999:416), the type of questions posed in the study should also be considered when deciding on a test measure. Appendix B provides a decision tree figure depicting how best to choose an appropriate statistical test. Appendix C provides a table with the statistical techniques based on the measurement levels and testing situations. The different inferential statistical methods available for researchers to choose the appropriate statistical test will be discussed from the figure in Appendix B and the table in Appendix C.

The type of questions to be answered in a study should be the starting point for researchers to decide which statistical test or tests to conduct. The reason is that the questions could be attempting to see if there are relationships or differences that exist (Howell, 1999:416). In studies examining relationships, the first consideration will be whether there are one or multiple predictors included in the study. When a study only has one predictor, the measurement scale has to be considered as this will influence which test can be used. The measurement used could be either of a continuous or ranked nature.

For continuous level of measurement (interval or ratio scale) there are two options for statistical tests. If the degree of the relationship is of interest to the researcher, then the Pearson correlation should be used (Howell, 1999:416). Correlation is the statistical method used to measure and describe the relationship which exists between two variables (Gravetter & Wallnau, 2013:510). Pearson's product-moment correlation (r) measures the degree and direction of a linear relationship between two variables. This is the most commonly used correlation test (Gravetter & Wallnau, 2013:514).

When the level of measurement is continuous and the form of the relationship is of interest to a researcher, then regression analysis would be the more appropriate test (Howell, 1999:416). According to Cooper and Schindler (2011:502-503), in relationship testing simple or multiple estimations and predictions can be made with the use of regression analysis. Regression analysis is said to be related to correlation, and it has been suggested that "beneath many correlation problems is a regression analysis that could provide further information about the relationship of Y with X " (Cooper & Schindler, 2011:503). A simple regression analysis involves approximating a relationship between a dependent and independent variable by way of a straight line.

If the measurement level in a study is ranked (ordinal scale), the appropriate statistical test to measure the relationship will be the Spearman correlation (Howell, 1999:416). The Spearman correlation is an alternative to the Pearson correlation and can be used specifically in two cases. The first case is to measure the relationship between two variables that were measured on an ordinal scale. The second is that it may be used to measure the relationship between two variables when there is clearly a one-directional relationship which is not necessarily linear (Gravetter & Wallnau, 2013:535-536). The Spearman correlation (r_s) formula is the following (Weiers, 2011:541):

$$r_s = 1 - \frac{6(\sum d_i^2)}{n(n^2-1)} \dots\dots\dots \text{(Eq 4.6)}$$

Where:

$\sum d_i^2$ = The sum of the squared differences between the ranks

n = Number of observations being ranked

For multiple predictors, the statistical test to use would be multiple regression (Howell, 1999:416). Multiple regression analysis is essentially an extension of simple regression (Cooper & Schindler, 2011:531). Multiple regression is defined as the analysis of how a dependent variable (Y) is related to two or more independent variables (X) (Anderson *et al.*, 2011:554).

Two tests available to test for relationships between variables that do not appear in Howell's (1999) decision tree in Appendix B are the rank biserial and polyserial correlation coefficient tests. The rank biserial is derived from the point biserial correlation. The rank biserial is calculated to measure the correlation between ordinal and one dichotomous (nominal) variable. The point biserial, on the other hand uses interval or ratio variable instead of ordinal data to test for a correlation (Yount, 2006:6-7). The polyserial correlation is used when a dichotomous or ordinal variable is correlated with an interval variable. It is said to be interpreted like the Pearson correlation (Garson, 2006:3).

The number of groups (either two or more) and the relationship between the samples need to be taken into account when researchers intend to test for differences between groups. Samples can be either independent or dependent, as each one requires the use of different statistical tests. Again the level of measurement should be considered in conjunction with the samples' relation (Howell, 1999:416).

Samples which are independent have two tests depending on the level of measurement. When it is continuous (interval or ratio scale) in nature, the two-sample t -test is appropriate. Test statistics have a general starting point of testing the population mean with the population standard deviation being known by using the Z -test to discover whether the sample mean (\bar{x}) deviates from the hypothesised value (population mean) enough to justify rejecting the null hypothesis. The two-sample t -test is used to test hypotheses (Anderson *et al.*, 2011:353).

More often than not, when conducting test statistics for hypothesis testing, the population mean with population standard deviation is unknown. The t -test is better suited to test hypotheses in this case, where the sample is used as an alternative to estimate the population mean (μ) and standard deviation (σ) (Weiers, 2011:330). There are now slight differences in calculating the test statistic and the p -value, as the sampling distribution uses a t distribution with $n - 1$ degrees of freedom (Anderson *et al.*, 2011:367). Degrees of freedom are defined as the parameter of the t distribution, and n is the size of the simple random sample (Anderson *et*

al., 2011:330). The test statistic *t*-test in this situation for one sample mean is (Howell, 1999:232):

$$t = \frac{\bar{x} - \mu}{\sqrt{\frac{s^2}{n}}} \dots\dots\dots (\text{Eq 4.7})$$

Where:

\bar{x}	=	Sample mean
μ	=	Population mean
s^2	=	Sample variance
n	=	Number of observations

When there are two independent samples being investigated, to determine the inference between two groups, the more appropriate *t*-test is (Weiers, 2011:368):

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)_0}{\sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}} \dots\dots\dots (\text{Eq 4.8})$$

Where:

$\bar{x}_1 - \bar{x}_2$	=	Means of samples 1 and 2
$(\mu_1 - \mu_2)_0$	=	Hypothesised difference between the population means
$n_1 - n_2$	=	Sizes of samples 1 and 2
s_p^2	=	Pooled sample variance: $s_p^2 = \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1 + n_2 - 2}$

The application of the pooled sample variance in the *t*-test is commonly used as it allows the test statistic to be calculated regardless of whether the population standard deviations are unequal or not, and when the sample sizes differ (Anderson *et al.*, 2011:405).

Should the level of measurement be ordinal (ranked), the Mann-Whitney U-test is to be used (Howell, 1999:416). The Mann-Whitney U-test is a non-parametric test used to determine whether two independent groups derive from the same population (Struwig & Stead, 2007:166). Kirk (2008:502) argues that, due to its modest assumptions, the Mann-Whitney U-test is a good alternative to the *t*-test for independent samples.

When there are multiple groups being examined for differences, the researcher needs to establish if the relationship between the samples is independent or dependent. The level of measurement has to be taken into consideration when deciding which statistical test to use. If the relationship between samples is independent, the number of independent variables has to be considered first. Should the number of independent variables be just one, there are two tests available to researchers, depending on the level of measurement.

If the level of measurement is continuous, the one-way ANOVA would be applicable (Howell, 1999:416). The analysis of variance (ANOVA) is defined as a statistical technique that can be used to examine the differences between means of two or more populations. A one-way ANOVA simply is where there is only one factor or categorical independent variable (Malhotra, 2010:531).

The test statistic for ANOVA is very similar to the construct of the t -test for independent samples, which is because the two tests are related in some ways (Gravetter & Wallnau, 2013:420, 452):

- The two tests will constantly attain similar statistical conclusions about the null hypothesis.
- The degrees of freedom for the t -test and the denominator of the F -ratio are identical.
- The distribution of t -test and F -ratio match perfectly when the relationship between the two test statistics, t -test and F -ratio, ($F = t^2$) is considered.
- The assumptions for the independent-measures t -test hypothesis testing are the same for independent-measures ANOVA. The basic assumptions are: the observations within each sample must be independent, and the populations from which the samples are selected should be normal and have equal variances.

Due to the fact that ANOVA tends to test two or more sample means, which is slightly more complex than comparing the differences between two samples as t -tests do, variance is used to “define and measure the size of the differences among the sample means” (Gravetter & Wallnau, 2013:390). The final test statistic for ANOVA takes the variance into account to calculate an F -ratio (Gravetter & Wallnau, 2013:390):

$$F = \frac{\text{Variance (differences) between sample means}}{\text{Variance (differences) expected with no treatment effect}} \dots\dots\dots (\text{Eq 4.9})$$

Levene's test for homogeneity is said to be an analysis of variance on the deviations of group means (Anderson, 2006:245). Gravetter and Wallnau (2013:343) stated that the Levene's test for homogeneity ideally should not be significant, because a researcher does not want to find that the two variances are essentially different. Therefore, the reported value should be greater than 0.05.

There still remain a number of inferential tests that researchers can use when a study contains multiple variables, as seen in Appendix B. However, those tests go past the scope of this research and therefore will not be discussed further. The statistical tests used in this study will be discussed under Section 4.4.4 of this chapter. The next section will present the methods used to collect and analyse data in phenomenological studies.

4.4.2 Data collection and analysis in phenomenological studies

Data collection methods for qualitative data generally involve focus groups, interviews (in-depth and semi-structured), case studies, and observations. As discussed in Section 4.3.2, qualitative data are characterised by interpretations of textual or oral data, and therefore the highlighted research methods are conducive to collecting qualitative raw information (Zikmund *et al.*, 2013:135, 141).

The coding of qualitative data collected involves the data being grouped into themes by means of codes, which "are labels that assign units of meaning to the information obtained" (Struwig & Stead, 2007:169). Codes are rarely isolated units of meaning; they are generally interpreted within a certain context, and are in relation to other codes (Struwig & Stead, 2007:169).

Data analysis of qualitative data involves the data being typed on a word-processor for analysis. From the word-processor, software programmes such as ATLAS, ETHNOGRAPH or HyperRESEARCH, can be used to conduct data analysis. Some researchers prefer hard-copy records for analysis purposes. The data analysis in phenomenological studies differs substantially from that of positivistic studies. Qualitative data coding is the most important aspect for analysis to take place, as there are generally no statistical tests involved in this type of data analysis (Struwig & Stead, 2007:169, 243). In the next section, the data collected for this research will be presented.

4.4.3 Data collected in this study

As stated earlier, this research used secondary data. The secondary data collection was done in three phases. The first phase was an extensive literature review, Chapters Two and Three, on ESG reporting in South Africa and internationally, as well as on metals and mining companies' ESG reporting. During the first phase various sources such as academic journals, books and non-academic sources were used to obtain information about the key constructs of the study. Sources such as EbscoHost, Scopus, Google Scholar, and websites were consulted in the collection of secondary data.

The second phase entailed the collection of data for the dependent variable, and the third phase consisted of data being collected for the independent variables. Data collection during the second and third phases will be discussed in greater detail in the subsequent sections. The sampling for this study will be presented first to provide context to the dependent variable.

4.4.3.1 Sampling

A population is defined as all the possible people, companies or other relevant respondents in a research study that have common characteristics and could possibly be included in the study (Blumberg *et al.*, 2011:167). A sample is a portion of the study's total population. It is generally impossible to reach the total population, and therefore it is more feasible to use a sample for research (Struwig & Stead, 2007:109).

As data are collected from samples, sampling errors can occur. A sampling error is referred to as "the natural discrepancy, or amount of error, between a sample statistic and its corresponding population parameter" (Gravetter & Wallnau, 2013:201). Since researchers can never be certain that the inference they have made from a sample is a valid inference for the population, inferential statistics are used to determine the level of uncertainty of results (Coldwell & Herbst, 2004:110).

There are different methods of sampling available for researchers, namely probability and non-probability sampling. Probability sampling is a method where every unit of the population has a known probability of being selected for a study. The researcher can make use of different methods for probability sampling, such as simple random, stratified, cluster,

systematic or multi-stage area sampling (Blumberg *et al.*, 2011:187). The five different probability sampling techniques available are given below.

First, simple random sampling is defined as each element of a population having an equal chance of being chosen, but the sample is selected by random method. Second, systematic sampling occurs when elements are given a natural ordering number, then an arbitrary starting point is chosen, and items are elected at pre-selected intervals. Third, stratified sampling is referred to as the population being divided into groups, and subsamples chosen from each group. Proportional or disproportional stratified sampling may be used. Fourth, cluster sampling is defined as a technique where sampling units are chosen at random, and then a complete observation of all the units is done. Finally, multistage sampling is when progressively smaller areas are selected in each stage by some combination of the first four techniques (Zikmund & Babin, 2010:433).

Non-probability sampling is a sampling method where the probability of a unit of the population being selected for a study is unknown. The researcher can make use of different methods of non-probability sampling, such as personal judgement, snowball, quota or convenience sampling (Struwig & Stead, 2007:111-112). The non-probability sampling techniques are described in more detail below.

Firstly, convenience sampling is the way in which the most convenient or economical sample or sample units are selected. Secondly, judgement sampling is the selection of a sample done based on the researcher's expertise or experience to ensure that certain criteria or characteristics are present. Thirdly, quota sampling occurs when the population is classified by pertinent properties, the desired proportion to sample is determined from each class, and quotas are set. Snowball sampling is choosing the initial respondents through probability samples, and additional respondents are selected based on the initial respondents' referral (Zikmund & Babin, 2010:432).

According to Hair *et al.* (2007:170-181), one of the main distinctions between probability and non-probability sampling is the ability of a sample to be generalised to the target population with a certain level of confidence. Probability sampling techniques allow for greater generalisation than non-probability sampling techniques. Probability sampling is characteristically used in quantitative research, while non-probability sampling is used in qualitative research.

In this study a non-probability sampling technique was used despite the fact that probability sampling has been stated as being a better technique for quantitative research. The reason for this choice was due to the samples not being drawn by the researcher, but by MSCI ESG Research based on client demand. Therefore, the non-probability sampling technique used by MSCI ESG Research was convenient sampling. There are two distinct sets of data that were used in this study and are considered the researcher's samples.

The first set of data related to the JSE as on 31 December 2012. Table 4.2 provides an overview of the population and sample on 31 December 2012, with a breakdown of the industries in which the listed companies operated.

Table 4.2: Population and sample of JSE-listed companies as on 31 December 2012

Industry classifications ^(a)	JSE population	MSCI's sample of JSE-listed companies	Recalculated MSCI sample of JSE-listed companies ^(b)	% of the MSCI sample relative to population ^(c)
Basic industries	46	15	15	32.61
Cyclical consumer goods	8	3	2	25.00
Cyclical services	63	17	13	20.63
Financials	87	28	28	32.18
General industries	32	7	6	18.75
Information technology	19	4	4	21.05
Non-cyclical consumer goods	33	15	15	45.45
Non-cyclical services	12	10	7	58.33
Resources	57	20	20	35.09
Utilities	2	0	0	0.00
Total	359	119	110	30.64
(a) Industry classification was sourced from Johannesburg Stock Exchange (2009).				
(b) The sample was decreased due to incomplete ESG data for nine companies.				
(c) The percentages were calculated using the recalculated MSCI JSE sample divided by the number of companies contained in the population.				

It can be seen from Table 4.2, that the total JSE population consisted of 359 companies on 31 December 2012, of which 119 companies (33.15%) were included in the MSCI ESG Research sample. However, when their data were assessed for completeness, it was found that nine companies had incomplete data (mainly for the Governance pillar score) and therefore could not be included in the final JSE sample to be analysed. The final sample thus consisted of 110 JSE-listed companies (30.64% of the total JSE population). Resource companies were the second largest constituents of the final sample on 31 December 2012 after the non-cyclical consumer goods. The resource industry consists of mining as well as oil and gas companies.

The number of resource companies listed on the FTSE/JSE All Share Index is relatively high in comparison to the Brazilian BM&FBOVESPA, where resource companies were only the

fourth largest constituents of the stock exchange (BM&FBOVESPA S.A., 2012:5; Revenue Watch, 2012). The JSE looked to increase the number of mining companies listed on the FTSE/JSE All Share Index over the last five years (Johannesburg Stock Exchange looks to list more resource companies, 2013). The reason is that local investors are thought to have a better understanding of the metals and mining industry, and therefore would invest in such companies if listed.

The second sample dealt with the Metals and Mining companies which operated in the countries which featured in the MSCI ESG Research database. The statistics on the Metals and Mining populations in the different countries were not readily available. The sample was created from the MSCI ESG Research database that was available as on 31 December 2012. As with the JSE sample, the Metals and Mining sample was not drawn by the researcher, but rather by MSCI ESG Research based on client demand. Table 4.3 consists of the Metals and Mining sample across different countries, the country status and BRICS (Brazil, Russia, India, China and South Africa) status for each country, as well as the legal system for each country.

Table 4.3: Sample of Metals and Mining companies on 31 December 2012

Country name	Number of companies	% of sample	Country status	BRICS classifications	Legal system
Australia	46	26.59	Developed	Non-BRICS	Common
United States of America	32	18.50	Developed	Non-BRICS	Common
Canada	21	12.14	Developed	Non-BRICS	Common
South Africa ^(b)	18	10.40	Emerging	BRICS	Mixed
United Kingdom ^(a)	11	6.36	Developed	Non-BRICS	Common
China	10	5.78	Emerging	BRICS	Civil
Indonesia	5	2.89	Emerging	Non-BRICS	Civil
Mexico	4	2.31	Emerging	Non-BRICS	Civil
Hong Kong	3	1.73	Emerging	Non-BRICS	Mixed
India	3	1.73	Emerging	BRICS	Common
Jersey ^(a)	3	1.73	Developed	Non-BRICS	Common
Japan	2	1.16	Developed	Non-BRICS	Civil
Poland	2	1.16	Emerging	Non-BRICS	Civil
Russia	2	1.16	Emerging	BRICS	Civil
Switzerland	2	1.16	Developed	Non-BRICS	Civil
Bermuda	1	0.58	Developed	Non-BRICS	Common
Egypt	1	0.58	Emerging	Non-BRICS	Mixed
France	1	0.58	Developed	Non-BRICS	Civil
Norway	1	0.58	Developed	Non-BRICS	Mixed
Peru	1	0.58	Emerging	Non-BRICS	Civil
Singapore	1	0.58	Developed	Non-BRICS	Common
South Korea	1	0.58	Developed	Non-BRICS	Mixed
Sweden	1	0.58	Developed	Non-BRICS	Civil
Thailand	1	0.58	Developed	Non-BRICS	Civil
Total	173	100			
(a) Jersey was listed under the United Kingdom; therefore there are 23 and not 24 countries in the sample.					
(b) The South African number of metals and mining companies dropped from 19 to 18 when the companies were reclassified for the Metals and Mining sample based upon country classifications.					

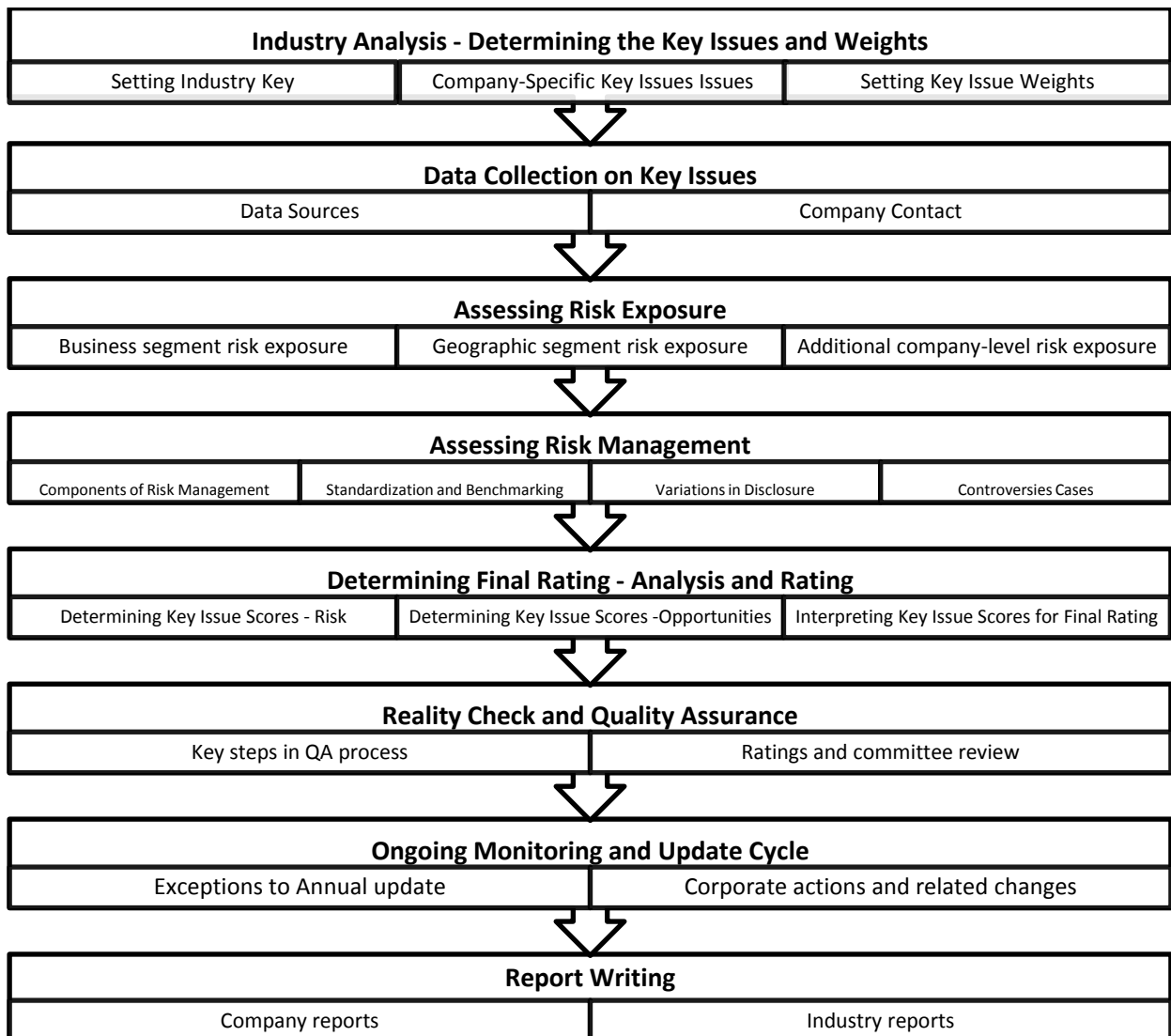
A more in-depth discussion will be presented on each of the variables included in Table 4.3 in Section 4.4.3.3. The Metals and Mining sample consisted of 173 companies spread across 23 countries. From Table 4.3, the three countries with most the companies analysed by MSCI ESG Research were from developed countries with a common law legal system. The countries, from which companies came, making up the majority of the sample, were Australia (26.59%), the USA (18.50%) and Canada (12.14%). South African companies appeared fourth in terms of number of companies that were assessed. This consisted of 18 South African JSE-listed companies, which represented 10.40 per cent of the sample.

Taking into consideration that MSCI ESG Research's database is formed from client demand, it is understandable that the top three countries with the most companies were developed countries. Owing to the stability of these economies, investors would probably be more interested in metals and mining companies in these countries than those operating in other countries. It is interesting to see that the number of South African Metals and Mining companies is not far off from the developed country companies (MSCI ESG Research, 2013a:3). Almost half the number of countries (43.48%), under MSCI ESG Research's analysis, was emerging markets. The data collection for the dependent variable for this study will be presented in the next section.

4.4.3.2 Dependent variable

The second phase of data collection consisted of the collection of ESG data from MSCI ESG Research Inc. for the JSE and Metals and Mining samples. As stated previously, MSCI ESG Research provides a range of data products and services. Some prominent products available include Intangible Value Assessment (IVA), Impact Monitor, Business Involvement Screening Research, Sovereign Ratings and MSCI ESG Portfolio Analytics (MSCI ESG Research, 2012). For this research, the MSCI ESG IVA was the product the researcher was most interested in.

In 2013, the MSCI ESG Research team evaluated 34 ESG data point issues for more than 5 000 companies across the globe. The focus is on the relationship relating to companies' core business and key industry ESG concerns that can generate ESG risks and opportunities for companies (MSCI ESG Research, 2013f:5). MSCI ESG Research has an extensive and complex methodology to produce the final IVA Company and Industry reports. The rating process and methodology for the IVA is depicted in Figure 4.3.

Figure 4.3: IVA rating process and methodology

Source: MSCI ESG Research (2013a; 2013f)

The IVA provides ratings and analysis of companies' risks and opportunities which stem from ESG factors. The IVA can assist in uncovering risks and opportunities that may not be realised through conventional financial analyses, owing to the in-depth analysis that takes place on material issues for companies and industries. The IVA is intended to help investors better understand ESG factors that drive risk and opportunities, and allow investors to integrate these factors into the construction and management process of their portfolios (MSCI ESG Research, 2013a:3).

The IVA is published as individual company reports and industry reports for MSCI ESG Research clients. In the company reports, a company gets a rating that is conveyed on a seven-point scale (AAA – CCC). The rating is established through the teams' quantitative

analysis of a company's exposure to ESG risks and opportunities, as well as a comparison with industry peers to determine how companies are managing their respective exposures (MSCI ESG Research, 2013a:3-4). The IVA Company and Industry reports contain an Industry-Adjusted Score, scores and weights for each of the E, S, and G pillars, the Key Issues which are industry specific, as well as scores and weights for additional issues that were investigated. The scores and weights contribute to the overall rating presented (MSCI ESG Research, 2013a:4).

The process that the MSCI ESG Research team follow begins with an industry analysis to determine what each industry's Key Issues will be under each of the E, S and G pillars. Each of the Key Issues is classified into the 10 themes, which were discussed in Chapter Two. In each theme, there are individual ESG criteria or Key Issues evaluated by MSCI ESG Research, as presented in Table 4.4 (initially provided in Table 1.1) (MSCI ESG Research, 2013a:6). Definitions for each of the ESG criteria can be found in Appendix A.

Table 4.4: ESG criteria evaluated by MSCI ESG Research

Environmental pillar	Social pillar	Governance pillar
Energy efficiency	Labour management	Corruption and instability
Water stress	Supply chain labour standards	Financial system instability
Raw material sourcing	Health and safety	Business ethics fraud
Biodiversity and land use	Human capital development	Anti-competitive practices
Carbon emissions	Product safety and quality	Corporate governance
Product carbon footprint	Chemical safety	
Toxic emissions and waste	Financial product safety	
Packaging material and waste	Privacy and data security	
Electronic waste	Insuring health & demographic risk	
Insuring climate change risk	Controversial sourcing	
Financing environmental impact	Opportunities in nutrition and health	
Opportunities in clean technology	Access to communication	
Opportunities in green building	Access to health care	
Opportunities in renewable energy	Access to finance	
	Responsible investment	

Source: MSCI ESG Research (2013a:6)

Key Issues are chosen to ensure that there is similarity in companies' core businesses. Key Issues are limited to between four and seven, and Corporate Governance is a set one. The

remainder of the Key Issues are chosen centred on the extent to which companies' activities in each industry create large ESG externalities (MSCI ESG Research, 2013a:6-7).

It can sometimes happen that an E, S or G Key Issue is identified for a company which would not be considered important for other companies in the same industry. In such occurrences, the Company-Specific Key Issue will be included in that company's analysis; however, the industry peers ratings will not be affected by this Key Issue. The IVA Methodology Committee will review and approve the inclusion of a Company-Specific Key Issue. When the Key Issues have been chosen, the weights set are used to ascertain the contribution to the overall rating from each Key Issue (MSCI ESG Research, 2013a:7). The weights were not examined in this study as they were already accounted for by MSCI ESG Research.

The second step in the IVA methodology involves the collection of data on Key Issues. Data are collected to measure a company's level of risk exposure and management. The data sources are corporate reports to determine the company's operations and from sources which map macro-level risk exposure to companies (such as Comprehensive Environmental Data Archive or Canadian Industrial Water Survey).

Data comes from the following sources (MSCI ESG Research, 2013a:8-9):

- *Corporate documents*: annual reports, environmental and social reports, securities filings, websites, and Carbon Disclosure Project responses.
- *Government data*: central bank data, US Toxic Release Inventory, Comprehensive Environmental Response and Liability Information System, Resource Conservation and Recovery Act Hazardous Waste Data Management System etc.
- *Popular, trade, and academic journals*: accessed through websites, subscriptions, and searches of online databases such as Factiva and Nexis.
- *Relevant organisations and professionals*: reports from and interviews with trade groups, industry experts, and non-governmental organizations familiar with the companies' operations and any related controversies.
- *Company interviews*: on an as-needed basis, analysts speak with company management (following the preliminary company analysis) to explore questions raised or left unanswered by that research. Companies are also permitted to view a text-only draft of their profile for fact-checking on request.

The third phase of the IVA methodology entails analysing companies' risk exposure to ESG factors. Risk exposure and management are two important components of Key Issue models. This allows for the Key Issue score to be adjusted according to the required strength of a company's management system in relation to the risk it is exposed to. Business opportunities in Key Issues instead of risks can also be evaluated.

As shown in Figure 4.3, Assessing Risk Exposure has three different aspects used for analysis and is dependent upon the Key Issue. These three aspects are (MSCI ESG Research, 2013a:9-10):

- *Business segment risk exposure*: this analyses the breakdown of a company in terms of revenues, operations or assets.
- *Geographic segment risk exposure*: this analyses the breakdown of a company's geographic segments in terms of revenues, operations or assets.
- *Additional company-level risk exposure factors*: these include, amongst others, the number of employees, reliance on government contracts and volume of sensitive commodities sourced.

Assessment of risk management is the next phase in Figure 4.3. To determine a company's ability to manage its risk exposure, Key Issues, are typically reduced to three categories. The first is strategy and governance which evaluates management's level of commitment and company capacity to address key risks and opportunities. Initiatives are the second category which assesses the strength and scope of initiatives, programmes and targets in place to improve performance on Key Issues. The third category is performance, which considers a company's past performance on specific risks and opportunities (MSCI ESG Research, 2013a:10-11).

Controversies that are considered severe, such as anti-competitive practices, are used as another means by which the MSCI ESG Research team assesses a company's risk management. Controversies are examined to determine whether they indicate a structural problem with the company's risk management capabilities, as this could lead to future risks for the company. The team's conclusion on the controversy cases will be included into the Key Issue score, usually as a deduction. However, should a case have been addressed by a company and pose no future material risk, the analysts can propose to the IVA Methodology Committee that the controversy be excluded from the risk management analysis (MSCI ESG Research, 2013a:11, 13).

MSCI ESG Research analysts standardise the collected data to accurately measure a companies' risk management capabilities. Even though the indicators used to score companies is standardised, specific region and industry information is sometimes required. Requiring additional standardisation steps into the process ensures that the indicators have captured the risks and opportunities facing companies correctly (MSCI ESG Research, 2013f:17).

Variations in a company's disclosure on ESG factors can occur and MSCI ESG Research accounts for this in their IVA in-depth analysis. Through the use of risk exposure and risk management assessment, the overall IVA rating of a company is divided between the two. The data required for the risk exposure, as mentioned earlier are derived from a company's financial reports; therefore there is no need for the IVA model to be adjusted to accommodate low or non-ESG disclosure (MSCI ESG Research, 2013f:17).

The risk management analysis, as discussed previously, is more reliant on companies' ESG disclosure, which is often not provided. Therefore MSCI ESG Research identified a set of baseline indicators which were found to be the most commonly disclosed Key Issues and more likely to differentiate companies from industry peers on risk management capabilities on each Key Issue. Under each of the three categories of risk management (strategy and governance, performance, and initiatives), IVA analysts never assume that owing to the lack of disclosure on a Key Issue, the company is the worst in the industry, or does not provide policies or is non-compliant with regulations. The methodology assigns a below industry average score, which is generally three out of 10 (MSCI ESG Research, 2013f:17-18).

The fifth step in the IVA methodology process is to determine the final ratings. First, the scores are determined for each Key Issue which evaluates company risk based on the combination of the risk exposure and risk management scores obtained. Secondly, for each Key Issue which measures opportunities, the risk exposure and risk management scores are combined. Key Issue scores range from 0 to 10 (MSCI ESG Research, 2013f:19).

For a company to receive a final letter rating, an Industry-Adjusted Score is required. This is done by first taking the weighted average of the Key Issue scores and standardising it against the highest- and lowest-ranking benchmarked companies in the peer set. The benchmarked peer set is comprised of the MSCI World Index constituents within the IVA Industry. The peer sets are used to calculate an industry-related rating to safeguard that companies' relative ratings are not altered when companies are added or removed from the benchmark peer set.

To obtain a preliminary Industry-Adjusted Score, the highest ranking company receives a 10, while the lowest ranking company receives a 0. The remainder of the companies' scores are then interpolated linearly, on the basis of the industry minimum and maximum scores (MSCI ESG Research, 2013a:12; 2013f:48).

The equation to calculate the Industry-Adjusted Score is (MSCI ESG Research, 2013f:48):

$$\text{Industry - Adjusted Score} = 10 * \left(\frac{(\text{weighted average score} - \text{min score})}{(\text{max score} - \text{min score})} \right) \dots \dots \{ \text{constrained from 0 to 10} \} \dots \dots \dots \text{(Eq 4.10)}$$

Once the Industry-Adjusted Scores have been calculated, the IVA Methodology Committee will consider any factors which may be overridden. Then the final Industry-Adjusted Scores can be corresponded with their respective letter ratings (MSCI ESG Research, 2013a:12).

The sixth phase in the IVA methodology process consists of a reality check and quality assurance. The IVA rating process does have a number of inclusive steps to ensure that the quality of analysis is high and that there is consistency in the methodology. There are three groups which are responsible for quality assurance of ratings and reviews. First, Industry and Team Leads are generally senior analysts who review the ratings and scores of companies in an industry peer group before they are finalised. Next, the IVA Methodology Committee review analysts' research of companies, on a weekly basis, if a trigger is found. A trigger could be anything from the need to include a Company-Specific Key Issue into company's assessment or a request to deviate from set weights or methodologies. Thirdly, the ESG Ratings Review Committee reviews proposals for changes to methodology throughout the ESG Research Group. During the quality assurance phase, company reports are usually peer-edited before publication can occur (MSCI ESG Research, 2013a:12-13).

The next step ensures that continuous monitoring and annual updates take place for company ratings. There are some exceptions to the annual timeframe updates. For example, should a company become involved in a very severe controversy or face financial risks due to their involvement in a negative ESG event, such as health and safety threats. These would lead the Ratings Review Committee to allow analysts to review the company mid-cycle. Sometimes the company's ratings could change or not and therefore, alter the company's performance score or not on a Key Issue. There are a number of activities which analysts take into consideration during the IVA rating process. These activities include company actions or

changes to the Index constituents, for example, new additions to the Indexes in the IVA coverage, company name change, spin-offs, mergers and acquisitions or sub-industry classification changes (MSCI ESG Research, 2013f:23-25).

Once all these aspects of the IVA rating process have been performed, the final company and industry reports can be written up. As stated earlier, the researcher was only interested in the quantitative analysis, more specifically the E, S, and G pillar scores and the Industry-Adjusted Score. The Industry-Adjusted Score was renamed to the Overall ESG Score in this research. The next section will provide insight into the data collection of the independent variables identified in Chapter Three.

4.4.3.3 Independent Variables

There were a total of 12 independent variables identified for this study, which could potentially have an influence on the extent of ESG reporting. Each of these independent variables was discussed in great detail in Chapter Three. This section provides information on how the data collection for each variable was conducted. The codes given for each of the different independent variables will be presented in Section 4.4.4.

The first independent variable investigated in Chapter Three was the FTSE4Good Index. This variable was applicable to the JSE and Metals and Mining samples. The FTSE4Good constituent list was obtained via email from the FTSE Client Services on 31 December 2012. The FTSE4Good Index consisted of 735 companies (FTSE International Limited, 2012).

South African companies' inclusion in the JSE SRI Index was the second independent variable examined. The 2012 constituent list comprised 77 companies. This list, which is available on the JSE website, was used to conclude which companies were included or excluded from the RI index in 2012 (Johannesburg Stock Exchange SRI Index, 2013)

The Nedbank Green Index was the next independent variable considered. The constituent list was downloaded from the Nedbank Green Index website for 2012 (Nedbank Capital, 2012a). From the 2012 constituent list of 43 companies, the researcher was able to establish which companies on the JSE sample were included or excluded from this RI index.

The fourth independent variable identified was the legal system of a country. This variable was identified for the Metals and Mining sample. The US Central Intelligence Agency World Factbook was used to determine the legal status of the country in which each company operated. As discussed in the literature review, three legal systems were acknowledged for this study, namely common law, civil law and mixed law (US Central Intelligence Agency, 2013).

The country in which a company operated for the Metals and Mining sample was the fifth independent variable studied. A country's status was classified as either developed or emerging. The definitions were provided in Section 3.4. The researcher used the World Bank classification for each country. In addition to the country status independent variable, the researcher included the BRICS classifications. Companies were classified as being either a BRICS or a non-BRICS country.

The industry in which a company operates was also recognised in Chapter Three as an independent variable that could potentially influence ESG reporting. For the JSE sample, the Tier one industry classification for each company was identified for 31 December 2012. Tier one is the economic group in which companies operate (Johannesburg Stock Exchange, 2009). This information was found on the JSE's website under its Global Classification System.

The seventh independent variable was companies' use of the GRI guidelines. The GRI's website provides a list of companies which state that the GRI guidelines were used in compiling their integrated reports. The GRI receives company's reports voluntarily and publishes the reports (integrated reports or sustainability reports) on the Sustainability Disclosure Database, with a description of whether the company report was compliant with the guidelines requirements or not (Global Reporting Initiative, 2013c). The researcher thus only searched on the Sustainability Disclosure Database for those companies which made up the study's samples in 2012.

The next independent variable was the UN Global Compact. Whether companies were UN Global Compact participants was established by utilising the UN Global Compacts website for the end of 2012. The UN Global Compact maintains a record of companies which are participants of this initiative (United Nations Global Compact, 2013a).

The remaining four independent variables were: financial performance, company size, board composition and ownership concentration. For three of the four variables, data were sourced from the Bureau van Dijk database. This data provider archives companies' annual reports and other information at an international level (Bureau van Dijk, 2013). Bureau van Dijk's methodology was examined to ensure that there were standardised equations used to calculate the various financial performance measures used in this study.

As was discussed in Section 3.8, financial performance can be measured in terms of market-based and accounting-based performance measures. The following accounting-based performance measures were thus downloaded from the database for the 2012 calendar year: ROA, ROE, EPS and total asset turnover. For the market-based performance measures, the market value to book value ratio was downloaded. To calculate the HPR, as per the Equation 3.5, the data collected included dividends (expressed per share) and the market price for year end 2011 and 2012. Financial performance data were not available for all companies in the samples (Bureau van Dijk, 2013).

Company size was the next independent variable to be examined. From Section 3.9, previous studies were found to have used total assets, the number of employees, total sales and market capitalisation to determine a company's size. For this study, market capitalisation was used to determine a company's size (Bureau van Dijk, 2013).

The last two independent variables were board composition and ownership concentration. For board composition, the purpose was to examine the balance between the NEDs and executive directors, to gauge the nature of board composition. Data on the JSE sample were obtained from a data base constructed by Mans-Kemp and Viviers (2014). Board composition data were not available for the international Metals and Mining sample. Data were collected for the 110 companies that made up the JSE sample in 2012. According to the King Report III (Institute of Directors in Southern Africa, 2009a:31), NEDs should make up the majority of a board of directors, which means that if the percentage of NEDs was above 50 per cent then the board was considered to be adhering to the King Report principles.

For ownership concentration, the number of recorded shareholders was used, as made available by Bureau van Dijk (2013). No clear indication could be found in the literature on the operationalisation of this variable. Therefore, an average was calculated for the JSE and the Metals and Mining samples ownership and codes were provided based on the average

number of recorded shareholders. The next section will provide a discussion of the editing, coding and analysis of data in this study.

4.4.4 Data editing, coding and analysis in this study

The editing of the data set was concluded when the researcher discovered that there were ESG data missing for nine of the 119 companies in the JSE sample. This meant the researcher had to limit the study's sample to 110 companies which had complete data. For the independent variables, where data could not be found for the financial performance, company size and ownership concentration, it did not alter the sample size for the other independent variables from being examined. Coding of the data was completed as shown in Table 4.5. It was necessary to code data as far as possible for statistical analysis purposes.

Table 4.5: Coding of the independent variables

Independent variable	Status	Code
The FTSE4Good Index as on 31 Dec 2012	Companies excluded from index	0
	Companies included in the index	1
The JSE SRI Index as on 31 Dec 2012	Companies excluded from index	0
	Companies included in the index	1
The Nedbank Green Index as on 31 Dec 2012	Companies excluded from index	0
	Companies included in the index	1
Legal system of companies in different countries	Common law	1
	Civil law	2
	Mixed law	3
Country status as on 31 Dec 2012	Emerging market	0
	Developed country	1
BRICS classifications	Non-BRICS	0
	BRICS	1
The industry in which a JSE-listed company operates as on 31 Dec 2012	Basic industries	1
	Cyclical consumer goods	2
	Cyclical services	3
	Financials	4
	General industries	5
	Information technology	6
	Non-cyclical consumer goods	7
	Non-cyclical services	8
	Resources	9
	Utilities	10
The use of GRI guidelines as on 31 Dec 2012	Non-use of GRI Guidelines	0
	Use of GRI Guidelines	1
UN Global Compact participant as on 31 Dec 2012	Non-participant of the UN Global Compact	0
	Participant of the UN Global Compact	1
Board composition as on 31 Dec 2012	Poor – below 50 per cent	0
	Good – above 50 per cent	1
Ownership concentration as on 31 Dec 2012 ^(a)	Poor – below the sample average	0
	Good – above the sample average	1
(a) The JSE sample had an average of 40 shareholders, and the Metals and Mining sample had an average of 46 shareholders. These averages were set as benchmarks.		

Once the data were edited and coded, data analysis could be concluded. Descriptive statistics for the dependent and independent variables were completed, using Microsoft Excel, SPSS and Statistica. For this study, mean and median were the measure of central tendency used and standard deviation was the measure of dispersion used. An analysis of the skewness and kurtosis of the distribution were conducted for both samples (Table 4.6), to determine whether the data sets were symmetrical or skewed.

Table 4.6: Descriptive statistics (skewness and kurtosis) for the JSE and Metals and Mining samples

Variables	JSE sample		Metals and Mining sample	
	$Sk^{(a)}$	$Ku^{(b)}$	$sk^{(a)}$	$ku^{(b)}$
Dependent variables				
Overall ESG score	0.169	-0.615	0.461	-0.35
Environmental pillar score	0.523	0.087	0.019	-0.84
Social pillar score	-0.489	0.198	0.227	-0.229
Governance pillar score	-0.251	-0.307	-0.427	-0.5
Independent variables				
Inclusion in the JSE SRI Index as on 31 Dec 2012	-0.298	-1.947	N/A	N/A
Inclusion in the Nedbank Green Index as on 31 Dec 2012	0.792	-1.399	N/A	N/A
Inclusion in the FTSE4Good Index as on 31 Dec 2012	N/A	N/A	4.359	17.201
Legal system in a country	N/A	N/A	1.254	0.049
Country status	N/A	N/A	-0.971	-1.07
Industry	0.061	0.457	N/A	N/A
The use of GRI guidelines as on 31 Dec 2012	-2.398	3.821	0.392	-1.868
UN Global Compact participant as on 31 Dec 2012	2.039	2.198	1.74	1.041
ROA as on 31 Dec 2012	-0.433	3.379	-1.995	6.412
ROE as on 31 Dec 2012	-4.479	28.779	-5.867	47.476
EPS as on 31 Dec 2012	9.535	91.265	6.99	59.075
Total asset turnover as on 31 Dec 2012	1.483	2.607	1.72	4.957
MV/BV as on 31 Dec 2012	5.77	43.24	4.943	34.418
HPR as on 31 Dec 2012	-3.451	32.919	-0.059	-0.565
Market capitalisation as on 31 Dec 2012	4.187	19.7	4.962	29.262
Board composition (% NEDs) as on 31 Dec 2012	-0.817	0.902	N/A	N/A
Ownership concentration as on 31 Dec 2012	1.802	5.662	0.812	1.281
(a) symmetrical when $sk = 0$; positively skewed, $sk > 0$; negatively skewed, $sk < 0$				
(b) mesokurtic distribution, $ku = 0$; platykurtic distribution, $ku < 0$; leptokurtic distribution, $ku > 0$				

From Table 4.6, it is clear that 10 variables for the JSE sample were positively skewed. The other eight variables were negatively skewed. For the international Metals and Mining sample, 12 variables were positively skewed and the remaining five were negatively skewed. Based on the kurtosis results, 14 variables for the JSE sample had a platykurtic distribution, while the rest had a leptokurtic distribution. The global Metals and Mining sample had 10 variables with a platykurtic distribution, and the remaining seven had a leptokurtic distribution. It can be surmised that the data were not normally distributed and therefore, non-parametric statistical tests ought to be used.

Inferential statistics on the two samples were performed using Statistica. Spearman's rank-order correlation, rank biserial correlation, polyserial correlation and the one-way ANOVA test were used in this study to test for relationships and the differences. The rank biserial and polyserial correlation test statistics are not commonly used tests. However, the researcher established that it was important these two tests were used because of the nature of the data. The Levene's test for homogeneity was completed where one-way ANOVA tests were calculated. The descriptive statistics and the inferential statistics will be presented in the results chapters, Chapter Five for the JSE sample and Chapter Six the Metals and Mining sample.

4.5 RELIABILITY, VALIDITY AND GENERALISABILITY

The concepts of reliability, validity and generalisability will be addressed here, as depicted in Figure 4.1, as these are considered important aspects of a research study. A researcher should always discuss to what extent the data and methodologies used in a study were reliable, valid and can be generalised past the confines of the research. When test scores are reliable, they are also valid (Struwig & Stead, 2007:130). Therefore reliability is considered first.

Reliability is defined as being concerned with the consistency of a study's research results (Hair *et al.*, 2007:241). Zikmund and Babin (2010:334) have stated that the best understanding of the reliability of a study is consistency, as both are achieved "when different attempts at measuring something converge on the same result". Reliability can be verified by means of four different methods, namely test-retest reliability, parallel-forms reliability, split-half reliability, and internal consistency reliability (Bryman & Bell, 2007:162).

In this study, to ensure that the data collected for this research were reliable, the researcher used secondary data from MSCI ESG Research. They use an extensive methodology and use a review committee to check the quality of the data collected by their analysts. As discussed earlier, MSCI ESG Research analysts collect data from various reliable data sources, such as a company's annual report or reports from a number of institutions which conduct environmental, social or governance research.

Validity is defined as the degree to which a study's research design was scientifically comprehensive or appropriately conducted (Struwig & Stead, 2007:136). According to Zikmund and Babin (2010:335), validity is the accuracy of a measure for an intended concept.

Validity is classified into two broad groups namely, external and internal validity. External validity is covered under generalisability. In terms of internal validity, there are three main methods available to assess validity (Cooper & Schindler, 2011:280-282):

- *Content validity*: refers to the extent to which a measurement instrument offers sufficient coverage to the research questions guiding the study. Judgement is often used as a means to determine the content validity, as the researcher examines the topic under investigation, what the items to be scaled are and which scales are to be used.
- *Criterion-related validity*: is used to determine the success of a measure which has been used in estimations or predictions. A correlation between the predictor measure and the criterion being analysed is done to establish criterion-related validity.
- *Construct validity*: attempts to ascertain how well a test represents the constructs being measured. To do this, the theory and the measuring instrument used are both considered to determine construct validity.

Construct validity was ensured in this study by selecting the appropriate statistical tests to make inferences.

Generalisability is the ability to generalise a researcher's results past the boundaries of the research sample to the wider population. The need for researchers to generalise a study comes from their tendency to imitate the quantitative methods of research (Struwig & Stead, 2007:5). The generalisability of this study could be extended to companies in other industries in the international market, as metals and mining was the main focus of this study.

4.6 SUMMARY AND CONCLUSIONS

A positivistic research methodology was adopted for this study based on the nature of the problem statement. As such, quantitative data were sourced to test the dependent and independent variables. The population consisted of all the JSE-listed companies and all the Metals and Mining companies in the MSCI ESG Research database as on 31 December 2012. A non-probability sampling technique, convenient sampling, was used by MSCI ESG Research, as the creation of their databases was client driven. The sample consisted of 110 JSE-listed companies and 173 Metals and Mining companies. The dependent variables data were collected from MSCI ESG Research's database. The data for the independent variables was collected from various reliable sources.

For the data analysis, descriptive statistics (mean, median, standard deviation, skewness and kurtosis) and inferential statistics (Spearman's rank-order correlation, rank biserial and polyserial correlation and a one-way ANOVA test) were conducted. In the following chapter, the descriptive and inferential results for the JSE sample will be presented.

CHAPTER FIVE

EMPIRICAL FINDINGS – JSE SAMPLE

5.1 INTRODUCTION

In the previous chapter, the research design and methodology chosen for this study were presented to demonstrate how the research was executed. The methods selected to analyse the data in the study were also discussed. In this chapter, the empirical findings from the JSE sample will be presented. First, the descriptive statistics for the dependent and independent variables will be reviewed; next, the inferential statistics will be presented.

The following research questions, applicable to the JSE sample were answered in this chapter:

- Are there statistically significant differences among the three pillars of non-financial reporting?
- Which pillar of non-financial reporting (i.e. E, S or G) featured the most prominently in the integrated reports of JSE-listed companies in 2012?
- Which aspects of ESG reporting by JSE-listed companies need more attention?
- Which factors influenced the extent of ESG reporting of JSE-listed companies in 2012?

5.2 DESCRIPTIVE STATISTICS

The theory behind descriptive statistics was discussed in Section 4.4.1.1. In the following sections, the descriptive statistics for the dependent and independent variables will be presented.

5.2.1 Dependent variable

The dependent variable for this study was the Overall ESG score sourced from MSCI ESG Research. Table 5.1 provides descriptive statistics on this variable for the JSE sample. As indicated in footnote (a) in Table 5.1, the mean scores were all calculated out of 10. The researcher considered a score ranging from $0 \leq$ four as *poor*, $4 \leq$ seven as *average*, and $7 \leq 10$ as *good*. The criteria were listed from the highest to the lowest mean scores.

Table 5.1: Descriptive statistics of the dependent variable for the JSE sample

Level of reporting	Criteria	N	Mean ^(a)	Standard Deviation	Min	Max
Overall ESG score^(b)		110	4.850	2.375	0.0	10.0
Overall Environmental pillar score		110	4.479	2.037	0.0	10.0
Environmental pillar	Insuring climate change risk	6	7.550	1.629	5.0	9.8
	Packaging material and waste	4	7.225	1.443	5.2	8.4
	Energy efficiency	19	6.863	1.513	4.6	10.0
	Carbon emissions	40	5.968	2.526	0.0	10.0
	Financing environmental impact	9	5.274	1.407	3.0	7.4
	Raw material sourcing	16	4.831	0.924	2.8	6.3
	Electronic waste	1	4.000	0.000	4.0	4.0
	Opportunities in clean tech	21	3.748	1.032	2.0	5.2
	Biodiversity and land use	25	3.510	1.807	0.8	8.6
	Toxic emissions and waste	43	3.405	1.609	0.5	7.8
	Water stress	37	2.773	2.136	0.0	6.4
	Product carbon footprint	9	2.433	1.486	0.0	5.1
	Opportunities in renewable energy	0	0.000	0.000	0.00	0.00
	Opportunities in green building	12	2.250	1.275	1.0	4.7
Overall Social pillar score		110	4.924	1.734	0.0	9.1
Social pillar	Product safety and quality	28	6.568	1.941	2.7	10.0
	Financial product safety	6	5.933	1.523	4.5	8.8
	Privacy and data security	11	5.860	2.525	1.5	8.7
	Access to finance	12	5.575	0.728	4.4	6.8
	Labour management	44	5.474	2.432	0.7	9.6
	Human capital development	10	5.426	2.563	1.0	9.1
	Access to communications	5	5.360	1.183	3.4	6.4
	Controversial sourcing	2	5.000	0.000	5.0	5.0
	Chemical safety	10	5.000	1.767	0.4	6.6
	Supply chain labour	8	4.513	1.968	0.3	6.2
	Health and safety	50	4.240	2.272	0.0	10.0
	Responsible investment	10	4.002	2.079	0.8	6.3
	Opportunities in nutrition and health	8	3.063	0.850	2.2	4.9
	Access to healthcare	3	2.267	0.666	1.5	2.7
	Insuring health and demographic risk	6	1.117	1.430	0.0	3.1
Overall Governance pillar score		110	6.063	2.130	1.2	10.0
Governance pillar	Corporate governance ^(c)	105	7.526	1.558	2.0	10.0
	Financial systems instability	12	7.108	1.647	4.6	10.0
	Business ethics and fraud	18	4.883	0.406	3.3	5.0
	Anti-competitive practices	17	4.559	1.248	0.0	5.0
	Corruption and instability	52	3.992	1.891	0.2	7.7
(a) The Overall, individual ESG and sub-element means were all calculated out of 10. (b) The Industry-Adjusted Score calculated by MSCI was re-named to the Overall ESG Score by the researcher. (c) This criterion deals with board structure, shareholders rights, auditing practices and transparency or compensation (either transparency or compensation is used, depending on the industry in which the company operates in) (MSCI ESG Research, 2013f:44).						

It is apparent from Table 5.1 that the mean Overall ESG score for JSE-listed companies in this sample was 4.85, which out of a total of 10 is unexpectedly low. The researcher expected, from literature reviewed, that companies would achieve a higher Overall ESG score as there have been ESG reporting requirements in place for JSE-listed companies since 2010.

When the individual pillar scores were examined, it was clear that the Governance pillar had the highest mean score, followed by the Social and Environmental pillars. The researcher expected the Governance pillar to have the highest mean score in the JSE sample because JSE-listed companies are obligated to report their corporate governance compliance relative to the King III principles.

In 2006, Sonnenberg and Hamann (2006:313) argued that the level of reporting on corporate governance by JSE-listed companies was not adequate for use by shareholders and stakeholders. Fortunately the situation changed. In 2012 Gasperini *et al.* (2012:27) found that there was greater compliance among JSE-listed companies in terms of corporate governance reporting. The two studies show how the King reports have influenced corporate governance reporting in the country. Although corporate governance reporting has apparently improved, the Governance score in this study was still average (6.06).

South African companies historically reported more on environmental concerns than on the other two pillars (Sonnenberg & Hamann, 2006:313). Van Zyl's (2013:919) findings, which show that environmental reporting received the least attention by companies, are consistent with this research, as the case in 2012 shows that the Environmental pillar score (4.48) was lower than both the Social and Governance pillar scores.

The empirical findings on the Environmental pillar score (4.48) in particular demonstrate that JSE-listed companies need to increase the amount of information disclosed on environmental issues. The researcher surmises that reporting on social considerations could also be improved, as the Social pillar score (4.92) was slightly higher than the Environmental pillar.

The Environmental and Governance pillars and the Overall ESG scores all had maximum scores of 10, while the Social pillar reached only a maximum score of 9.1. Companies which obtained a 10 had the highest possible level of reporting and transparency on specific issues using the MSCI measurement instrument. In terms of the minimum values, Governance was the only pillar to have a minimum value of 1.2, while the other two pillars and the Overall ESG score all had minimums of zero. The higher minimum value for the Governance pillar is an encouraging sign that it is a factor that companies are taking earnestly.

The criteria for each pillar with the highest and lowest mean score will be discussed, assuming that at least a quarter or more of the JSE sample had such a score. Under the

Environmental pillar, companies achieved the highest mean score for carbon emissions (5.97) and the lowest mean score (2.77) for water stress. It is to be expected that JSE-listed companies would generally rate high on carbon emissions, as the CDP is a well-known initiative which has considerably influenced the management and corporate reporting of carbon emission among local companies (Carbon Disclosure Project, 2012:10; Warren & Thomsen, 2012:7). Van Zyl (2013:919) pointed out that companies which can contextualise items like carbon emissions have better environmental reports than those companies which are unable to explain why they report on such issues.

Water stress is a criterion which was expected to have a higher mean score because water supply and water quality are concerns for the whole country, and specifically for a high-impact industry such as mining (Chamber of Mines of South Africa, 2012). The Chamber of Mines of South Africa supports the Department of Water Affairs' National Water Resources Strategy by guiding mining companies on the protection, utilisation, conservation, management and control of the country water resources (Chamber of Mines of South Africa, 2012). Although water is of particular importance in the metals and mining industry, all JSE-listed companies should ensure that water is adequately managed and their progress to improve water efficiency is reported. Poor water management could negatively influence the natural environment and society (Chamber of Mines of South Africa, 2012).

For the Social pillar, the product safety and quality criterion had the highest mean score (6.57). As this criterion deals with the risk of product recalls or losing customers owing to poor quality or unsafe products, it is understandable that companies have high scores. Companies avoid this risk of product recalls and losing customers through management and reporting of their product safety and quality (MSCI ESG Research, 2013f:97).

Health and safety considerations featured at the bottom of the Social pillar list with a mean score of 4.24. Poor scores show that there is a need for better management and reporting of health and safety within companies. Even though there is legislation in place to ensure that companies are compliant in terms of health and safety issues in South Africa, companies sometimes have problems contextualising the social issues disclosed in their non-financial reports (Van Zyl, 2013:920). Companies often only disclosed that they were socially conscious when they perceived that it would be aligned with their profitability, rather than because the law requires disclosure on social issues (Van Zyl, 2013:913).

In the Governance pillar, companies achieved the highest mean score for the corporate governance criterion (7.53) and the lowest mean score for corruption and instability (3.99). As indicated earlier, MSCI defines corporate governance broadly as the manner in which companies are able to “manage conflicts between investors and management” (Barclays MSCI ESG Fixed Income Indices, 2013:7). Observing that the corporate governance score was the highest was to be expected since the King reports play a large part in JSE-listed companies’ ESG reporting.

Companies rated poorly in terms of corruption and instability (3.99), which is not a good sign. According to the Transparency International (2013), South Africa ranked 69th from 176 countries in 2012 and scored a meagre 43 out of 100. This indicates that the country is perceived as experiencing a great deal of corruption. Therefore, increased non-financial and financial reporting will provide stakeholders with more information and avoid companies being perceived as corrupt and hiding information (Marocco, 2010:79). This rating by Transparency International (2013) is reiterated by examining the MSCI’s rating of JSE-listed companies on this criterion. The researcher concludes that JSE-listed companies need to improve their management of ESG risks, and become more transparent through improved non-financial reporting.

As indicated in Section 1.4.3, one of the research questions was whether there was a statistically significant difference between the three pillars of non-financial reporting in the JSE sample. Table 5.2 presents the findings from the one-way ANOVA.

Table 5.2: One-way ANOVA results: differences among the three non-financial reporting pillars for the JSE sample

Variables	Overall ESG mean	Current effect	One-way ANOVA	Levene’s test for homogeneity	
				F	p
Environmental pillar	4.479	F(2, 218) = 22.462	p = 0.000*	22.462	0.000
Social pillar	4.924				
Governance pillar	6.063				
1st - Mean		2nd - Mean	Mean - Difference	p	
Environmental pillar		Social pillar	-0.445	0.069	
Environmental pillar		Governance pillar	-1.584	0.000*	
Social pillar		Governance pillar	-1.139	0.000*	

* Significant at the 5% level

It is evident from the results in Table 5.2 that there is a statistically significant difference between the means of the three pillars. Taking a closer look, it can be seen that a significant difference existed between the Governance pillar score and the Environmental and Social pillar scores. The Governance pillar score across the JSE sample was significantly higher than the mean scores for the other two pillars. The findings could be interpreted as JSE-listed companies being better at reporting governance considerations than environmental and social considerations in 2012.

After reviewing the different criteria with the highest and lowest mean scores, the researcher identified companies in the JSE sample with the lowest and highest Overall ESG and individual pillar mean scores. Table 5.3 presents the identified companies by name and the industries in which they operate. The purpose of the table was to observe which companies and which industry were ranked the highest and lowest respectively.

Table 5.3: JSE-listed companies with the highest and lowest Overall and individual ESG pillar scores

	Score	Company	Industry
Overall ESG score	Highest (10)	ABSA Group Ltd.	Financials
		Investec Ltd.	Financials
		Telkom SA Ltd.	Non-cyclical services
	Lowest (zero)	Assore Ltd.	Resources
Environmental pillar score	Highest (10)	Telkom SA Ltd.	Non-cyclical services
	Lowest (zero)	Reunert Ltd.	General industries
Social pillar score	Highest (9.1)	Intu Properties Plc.	Financials
	Lowest (zero)	Assore Ltd.	Resources
		Harmony Gold Mining Company Ltd.	Resources
Governance pillar score	Highest (10)	Omnia Holdings Ltd.	Basic industries
		PPC Ltd.	Basic industries
		Sappi Ltd.	Basic industries
		Hudaco Industries Ltd.	Cyclical consumer goods
		African Bank Investments Ltd.	Financials
		Old Mutual Plc.	Financials
		British American Tobacco Plc.	Non-cyclical consumer goods
		SPAR Group Ltd.	Non-cyclical services
	Lowest (1.2)	Raubex Group Ltd.	Basic industries

Closer examination of which companies achieved the highest and lowest scores reveals that quite a few companies in the local metals and mining industry had the lowest Overall ESG score as well as the lowest Social pillar score. Financial companies seemed to be better at managing and reporting their ESG considerations, seeing that those which achieved the highest scores did so for Overall ESG score as well as Social and Governance pillar scores.

The researcher is now in a position to answer the next two research questions from Section 1.4.3 applicable to the JSE sample. It is concluded that Governance considerations featured the most in JSE-listed integrated reports in 2012 based on the mean scores. There was a large difference between the Governance pillar score and the Environmental and Social pillar scores. First, the researcher concludes that the JSE-listing requirements and King III had a critical influence on the extent of corporate governance reporting owing to the extensive principles of the King III. Second, the researcher found recent literature to support the results in terms of environmental and social considerations being poorly reported on. This could be due to the simple fact that these pillars and criteria are harder to contextualise than corporate governance considerations (Van Zyl, 2013:920).

The third research question dealt with the aspects of ESG reporting by JSE-listed companies that need more attention. It was seen from the descriptive statistics that Environmental and Social considerations require more attention. Companies should essentially dedicate more attention to all those criteria where the scores were equal to or less than four. As stated earlier, low scores were classified by the researcher as representing poor management and reporting of ESG concerns.

Where companies scored low on the Environmental and Social criteria, it could be either owing to not managing their environmental and social concerns effectively, or not reporting on these considerations. The lack of ESG reporting could be taken as companies not being transparent with their stakeholders. Literature suggested that transparency was a benefit of ESG reporting for stakeholders, especially investors who consider such information in their investment decision-making process (Brammer & Pavelin, 2008:121; De Villiers & Lubbe, 1998:21).

5.2.2 Independent variables

In Chapter Three, 10 factors were identified specifically for JSE-listed companies. Descriptive statistics on five of these will be discussed in the next section and presented in Table 5.4.

Table 5.4: Sample sizes of the independent variables (RI indices, GRI and UN Global Compact) for the JSE sample

Independent variable	Status	Sample	
		N	%
Inclusion in the JSE SRI Index as on 31 Dec 2012	Companies excluded from index	47	42.73
	Companies included in the index	63	57.27
	Total	110	100.00
Inclusion in the Nedbank Green Index as on 31 Dec 2012	Companies excluded from index	75	68.18
	Companies included in the index	35	31.82
	Total	110	100.00
Inclusion in the FTSE4Good Index as on 31 Dec 2012	Companies excluded from index	110	100
	Companies included in the index	0	0
	Total	110	100.00
The use of GRI guidelines as on 31 Dec 2012	Non-use of GRI guidelines	13	11.82
	Use of GRI guidelines	97	88.18
	Total	110	100.00
UN Global Compact participant as on 31 Dec 2012	Non-UN Global Compact participant	94	85.45
	UN Global Compact participant	16	14.55
	Total	110	100.00

From Table 5.4, it can be observed that 57.27 per cent of the JSE sample (63 companies) was included in the JSE SRI Index on 31 December 2012. As stated previously, the MSCI data set was created based on client demand. The researcher was aware that this could lead to the results being biased towards ESG reporting. In both the JSE SRI Index ($n = 77$) and the JSE sample ($n = 63$), approximately a quarter of companies were metals and mining companies. In the researcher's opinion, more diverse companies should strive to be included in this index, as it demonstrates to stakeholders that companies are conscious and take action regarding ESG concerns.

Almost a third of the companies contained in the JSE sample (31.82%) were included in the Nedbank Green Index. The number of companies included in the Nedbank Green Index is far less than those included in the JSE SRI Index. However, this could be owing to the Nedbank Green Index considering only the top 100 FTSE/JSE-listed companies and having strict environmental criteria (Nedbank Group, 2013). If more JSE-listed companies work towards inclusion in this RI index, this may increase their awareness and resulting actions towards environmental considerations (Nedbank Group, 2013).

As can be observed in Table 5.4, no JSE-listed companies were included in the FTSE4Good Index. This was an interesting result as it was expected that there would be at least a few of the international companies included in this index. Based on the literature reviewed, RI indices (JSE SRI Index, the Nedbank Index and the FTSE4Good) are expected to increase the

standard of ESG reporting as these indices highlight responsible companies. Companies which are not included in a RI index can use those which are, as a benchmark for quality ESG reporting.

In the JSE sample, 88.18 per cent of companies used the GRI guidelines for setting up the ESG component of their integrated reports. This is a positive sign, as the guidelines are aimed at improving ESG reporting. In the JSE sample, 12.36 per cent of the companies using the GRI guidelines were metals and mining companies. This is a small percentage of the number of metals and mining companies which could be using the GRI guidelines. The main aim of the GRI guidelines (and investors' greatest need) is for financial and non-financial reports to be standardised. The researcher suggests that more companies across all industries should employ the GRI guidelines to integrated reporting.

Close to 15 per cent of the JSE sample were UN Global Compact participants. The number of participants was unexpectedly low especially since the literature suggested that the number of participants globally had increased over the last decade, with South Africa being no exception (United Nations Global Compact, 2013a). The researcher considered a reason that may explain the small percentage of companies being participants could be owing to the financial commitment involved. Participants are asked to make a contribution to the non-profit organisation, based on companies' annual revenue (United Nations Global Compact, 2014).

There are, however, a number of benefits to companies for being a participant, such as having access to information and knowledgeable people to speak with about ESG issues and solutions. The researcher is convinced that more South African companies need to become UN Global Compact participants to encourage management to improve their ESG reporting (United Nations Global Compact, 2013c).

Table 5.5 provides additional descriptive statistics on the independent variables dealing with the RI indices, GRI, UN Global Compact, board composition, and ownership concentration.

Table 5.5: Descriptive statistics of the independent variables for the JSE sample

Independent variable	Status	Dependent variable	N	Mean	Standard Deviation	Min	Max
Inclusion in the JSE SRI Index as on 31 Dec 2012	Companies excluded from index	Overall ESG Score	47	4.294	2.305	0	9.5
		Environmental Score	47	3.809	1.905	0	8.4
		Social Score	47	5.100	1.849	0	9.1
		Governance Score	47	3.809	1.905	0	8.4
	Companies included in the index	Overall ESG Score	63	5.264	2.360	0.4	10.0
		Environmental Score	63	4.978	2.002	1.2	10.0
		Social Score	63	4.792	1.646	0.0	7.8
		Governance Score	63	6.084	2.033	1.4	10.0
	Total		110				
Inclusion in the Nedbank Green Index as on 31 Dec 2012	Companies excluded from index	Overall ESG Score	75	4.840	2.517	0.0	10.0
		Environmental Score	75	4.181	1.954	0.0	8.5
		Social Score	75	5.140	1.737	0.0	9.1
		Governance Score	75	5.963	2.082	1.2	10.0
	Companies included in the index	Overall ESG Score	35	4.870	2.074	0.4	10.0
		Environmental Score	35	5.115	2.093	2.4	10.0
		Social Score	35	4.459	1.659	0.0	7.0
		Governance Score	35	6.277	2.244	1.4	10.0
	Total		110				
The use of GRI guidelines as on 31 Dec 2012	Non-use of GRI guidelines	Overall ESG Score	13	3.874	2.305	0.4	6.7
		Environmental Score	13	4.154	2.136	1.5	8.0
		Social Score	13	4.538	2.231	0.8	9.1
		Governance Score	13	4.154	2.136	1.5	8.0
	Use of GRI guidelines	Overall ESG Score	97	4.980	2.366	0.0	10.0
		Environmental Score	97	4.522	2.031	0.0	10.0
		Social Score	97	4.975	1.664	0.0	8.4
		Governance Score	97	6.117	2.062	1.4	10.0
	Total		110				
Being a UN Global Compact participant as on 31 Dec 2012	Non-UN Global Compact participant	Overall ESG Score	94	4.749	2.336	0.0	10.0
		Environmental Score	94	4.411	2.046	0.0	10.0
		Social Score	94	5.025	1.743	0.0	9.1
		Governance Score	94	6.045	2.134	1.2	10.0
	UN Global Compact participant	Overall ESG Score	16	5.441	2.592	1.9	10.0
		Environmental Score	16	4.875	1.997	2.0	8.4
		Social Score	16	4.325	1.603	1.7	6.9
		Governance Score	16	6.169	2.172	1.4	10.0
	Total		110				
Board composition (% NEDs) as on 31 Dec 2012	Companies with poor composition	Overall ESG Score	2	5.300	0.849	4.7	5.9
		Environmental Score	2	4.000	0.566	3.6	4.4
		Social Score	2	4.850	0.495	4.5	5.2
		Governance Score	2	7.000	0.000	7.0	7.0
	Companies with good composition	Overall ESG Score	108	4.809	2.362	0.4	10.0
		Environmental Score	108	4.612	2.161	0.0	10.0
		Social Score	108	4.871	1.629	0.0	9.1
		Governance Score	108	6.198	2.199	1.2	10.0
	Total		110				
Ownership concentration as on 31 Dec 2012	Companies with below average concentration	Overall ESG Score	61	4.913	2.401	0.0	10.0
		Environmental Score	61	4.401	2.092	0.3	10.0
		Social Score	61	5.143	1.624	0.0	7.8
		Governance Score	61	6.272	2.039	1.2	10.0
	Companies with above average concentration	Overall ESG Score	45	4.906	2.371	0.4	10.0
		Environmental Score	45	4.656	1.991	0.0	9.8
		Social Score	45	4.708	1.882	0.0	9.1
		Governance Score	45	5.885	2.203	1.4	10.0
	Total		106				

In terms of the JSE SRI Index, it can be seen from Table 5.5 that the companies included in the RI index generally achieved higher mean scores for the Overall ESG, and for two of the three pillars (Environmental and Governance) than companies which were excluded from the JSE SRI Index. It was observed that for the Social pillar, companies excluded from the JSE SRI Index actually yielded a slightly higher mean score (5.10) than those included in the RI index (4.79).

For the Nedbank Green Index, companies included in this RI index achieved higher mean scores for the Overall ESG, and for two of the three pillars (Environmental and Governance) than companies which were excluded from the Nedbank Green Index. The Environmental pillar score was slightly higher for companies included in this index (5.12) than companies not included (4.18). The researcher expected such a finding, as this index focuses purely on environmental considerations.

Recall from Figure 3.1 that RI indices were classified as being in the macro business environment, where companies had no or very little control over factors. The control of companies being included in an RI index lies with the index and the criteria that are used for selecting companies. The researcher posits that companies have some control over this influencing factor, because companies could strive to meet the requirements set by RI indices, should management really wish for the company to be included in an RI index.

The remaining four independent variables, from Table 5.5, were classified as part of the micro business environment, in which companies have extensive control over the factors that could influence their ESG reporting. For example, companies choose whether or not they want to use the GRI guidelines or be a participant of the UN Global Compact. Companies also have a say in their board composition and ownership concentration.

Unlike with the two RI indices discussed above, JSE-listed companies using the GRI guidelines had higher mean scores for the Overall and individual ESG pillars. This is a positive sign and may indicate that the guidelines do in fact bring companies' attention to all three ESG aspects in an equal manner. Companies which were UN Global Compact participants (14.55%) achieved higher Overall ESG, Environmental and Governance pillar mean scores than those which were not participants. However, companies that were not participants yielded a higher (5.03) Social pillar mean score than those companies which were UN Global Compact participants (4.33).

Discovering that the Social pillar mean scores were not corresponding to the other two pillars and Overall ESG scores for companies which were included in RI indices, or which were UN Global Compact participants, was unexpected. The researcher was inclined to think that laws and policies that South African companies are meant to be following to ensure that health systems, labour management and other social aspects discussed in Section 2.2.2, are not adequately adhered to by JSE-listed companies (Mitchell & Hill, 2009:52). The researcher takes another perspective on these findings, and surmises that perhaps companies are reporting on social issues, but that the information being disclosed was of no material value to stakeholders. Companies want to be seen as responsible and sustainable to enhance their reputation, which could lead to some window dressing of their financial and non-financial reports (Clark & Grist, 2014:17).

Board composition is the next independent variable in Table 5.5. It can be seen that only two companies had 'poor' board compositions in the JSE sample. The 'poor' label was determined from King III, which suggested that boards should comprise a majority (50% or more), of NEDs (Institute of Directors in Southern Africa, 2009a:31). The two companies with 'poor' board composition were Pinnacle Technology Holdings Ltd (40%) and Net 1 UEPS Technologies Inc. (42.9%). The researcher notes that companies with more than 50 per cent of independent directors had better Environmental and Social mean scores than the two companies with poor composition. However, given the inequality in the sample sizes, this is not a valid finding.

The last independent variable in Table 5.5 is ownership concentration, which was based upon the sample's average ownership concentration. Companies with a below-average concentration (57.55%) were classified as having 'poor' ownership concentration. Ownership concentration in this study refers to the number of shareholders a company had on 31 December 2012. From the Overall ESG score, no significant difference existed between the mean scores for those with a below-average and those with an above-average ownership concentration in Table 5.5. Companies considered to have a below-average concentration achieved higher means for the Social and Governance pillar scores, while companies with an above-average concentration only had a higher Environmental pillar score mean.

The industries in which companies operate were identified in Section 3.4 as a potentially important independent variable. In Table 5.6, descriptive statistics are provided for the nine JSE industries investigated in this study.

Table 5.6: Descriptive statistics for the independent variable (industry) for the JSE sample

Industry		N	Mean ^(a)	Standard Deviation	Min	Max
Basic industries	Overall ESG Score	15	3.764	1.400	0.4	6.0
	Environmental Score	15	3.916	1.091	2.4	5.9
	Social Score	15	5.317	1.616	2.3	7.8
	Governance Score	15	5.473	3.235	1.2	10.0
Cyclical consumer goods	Overall ESG Score	2	8.335	0.332	8.1	8.6
	Environmental Score	2	4.700	0.707	4.2	5.2
	Social Score	2	6.950	0.071	6.9	7.0
	Governance Score	2	9.250	1.061	8.5	10.0
Cyclical services	Overall ESG Score	13	6.354	2.136	2.1	9.5
	Environmental Score	13	5.562	1.785	2.6	8.5
	Social Score	13	5.699	1.821	2.5	8.4
	Governance Score	13	7.054	0.999	5.2	8.5
Financials	Overall ESG Score	28	5.118	2.576	1.7	10.0
	Environmental Score	28	4.936	2.160	1.6	9.8
	Social Score	28	5.243	1.495	2.6	9.1
	Governance Score	28	6.850	1.638	2.0	10.0
General industries	Overall ESG Score	6	4.520	2.560	0.6	8.3
	Environmental Score	6	5.200	2.609	0.0	7.3
	Social Score	6	5.417	1.251	3.6	6.9
	Governance Score	6	6.183	1.800	2.8	7.4
Information technology	Overall ESG Score	4	6.050	1.237	4.7	7.7
	Environmental Score	4	4.075	1.389	2.5	5.8
	Social Score	4	5.400	0.876	4.5	6.6
	Governance Score	4	7.375	0.750	7.0	8.5
Non-cyclical consumer goods	Overall ESG Score	15	5.000	1.947	0.8	7.8
	Environmental Score	15	3.567	2.330	0.3	8.4
	Social Score	15	4.996	1.489	1.4	7.0
	Governance Score	15	5.533	2.500	1.4	10.0
Non-cyclical services	Overall ESG Score	7	7.067	1.772	5.3	10.0
	Environmental Score	7	6.643	2.346	4.0	10.0
	Social Score	7	5.557	0.866	4.5	7.0
	Governance Score	7	5.886	2.168	3.6	10.0
Resources^(b)	Overall ESG Score	20	2.931	1.719	0.0	6.8
	Environmental Score	20	3.325	1.039	1.5	5.7
	Social Score	20	2.955	1.477	0.0	5.5
	Governance Score	20	4.601	1.002	2.6	6.5
(a) The Overall and individual ESG pillar scores were all calculated out of 10.						
(b) Includes all the metals and mining companies analysed in this study.						

From Table 5.6, it can be seen that the cyclical consumer goods industry had the highest mean Overall ESG scores, whereas the resources industry had the lowest mean Overall ESG score. The lower Overall ESG score for the resources industry was unexpected because literature had found that resource companies often had higher levels of non-financial reporting than companies in other industries (De Villiers & Barnard, 2000:16). However, it is understandable that in comparison with other industries, resources would score less as they are a high-impact industry, and progress on environmental issues in particular might be

slower than in other industries (Gasperini *et al.*, 2012:3). The researcher will take a closer look into the resources industry in Chapter Six.

The Governance pillar consistently had the highest mean score of the three pillars across all the industries (excluding non-cyclical services), which supports early findings in this regard. The low Social pillar score (2.955) and the low Environmental pillar score (3.325) for the resources industry, may be accredited to the fact that this is a labour-intensive, highly risky and high environmental impact industry (Johannesburg Stock Exchange SRI Index, 2011). Companies in this industry have a large impact on both the natural environment and society, which therefore calls for proper ESG reporting. One reason for the low Social pillar score for metals and mining companies, could have been the large number of labour disputes during 2012 (SA Mine Highlighting trends in the South African mining industry, 2012).

The descriptive statistics for the remaining independent variables, accounting and market-based financial performance, and company size are presented in Table 5.7. The dataset for the financial performance and company size based on market capitalisation contained a few outliers. The outliers identified were not removed from the dataset, as the dataset was already considered small. Instead, the researcher decided that with the inferential statistics, the test statistic chosen would be one that is less sensitive to outliers than other tests, such as the Spearman rank correlation coefficient.

Table 5.7: Descriptive statistics for the remaining independent variables for the JSE sample

Independent variables	N	Mean	Median	Standard Deviation	Min	Max
ROA as on 31 Dec 2012 ^(a) (%)	99	3.779	4.600	11.873	-54.260	57.040
ROE as on 31 Dec 2012 ^(a) (%)	99	5.148	10.790	42.979	-461.020	99.110
EPS as on 31 Dec 2012 ^(a) (US Dollars)	92	1.277	0.147	11.872	0.000	179.628
Total asset turnover as on 31 Dec 2012 ^(a) (times)	104	1.048	0.810	1.314	-0.003	17.356
MV/BV as on 31 Dec 2012 ^(b) (times)	104	2.288	1.391	10.446	-112.791	125.140
HPR as on 31 Dec 2012 ^(b) (US Dollars)	61	-11.460	-0.618	111.950	-981.667	593.732
Size (market capitalisation) as on 31 Dec 2012 (US Dollars)	104	2 669 862.24	203 726.80	9 438 638.38	0.000	96 398 644.34
(a) Accounting-based financial performance measure.						
(b) Market-based financial performance measure.						

It is evident from Table 5.7 that the mean and median scores for the ROA, ROE and EPS were all positive in 2012. The average total asset turnover was also positive, and can be

interpreted as the average company having converted its assets into revenue in 2012. The market value to book value (MB/BV) ratio had a positive mean and median as well. The negative HPR could possibly be explained by the decrease in share prices from the beginning to the end the year. In the next section, the inferential statistics for the JSE sample will be presented.

5.3 INFERENCE STATISTICS

The theory behind the different inferential statistics available was discussed in Chapter Four Section 4.4.1.2. Inferential statistics are necessary as they assist in answering the research questions and testing the appropriate hypotheses formulated in Chapter Three. The hypotheses in Table 5.8 were presented in Chapter Three, and all relate to the JSE sample.

Table 5.8: Hypotheses relating to the JSE sample and the appropriate tests used

Business Environment	Independent variable	Relevant hypotheses to be tested	Test statistic used
Macro	Inclusion in an RI index	H_{0,1} : There is no relationship between the extent of ESG reporting by JSE-listed companies and inclusion in the JSE SRI Index.	Rank biserial correlation
		H_{0,2} : There is no difference between the extent of ESG reporting by JSE-listed companies included in the JSE SRI Index and those excluded from the index.	One-way ANOVA
		H_{0,3} : There is no relationship between the extent of ESG reporting by JSE-listed companies and inclusion in the Nedbank Green Index.	Rank biserial correlation
		H_{0,4} : There is no difference between the extent of ESG reporting by JSE-listed companies and inclusion in the Nedbank Green Index.	One-way ANOVA
Market	Industry	H_{0,11} : There is no relationship between the extent of ESG reporting by JSE-listed companies and the industry in which the company operates.	Spearman correlation
		H_{0,12} : There is no difference between the extent of ESG reporting by JSE-listed companies and the industry in which the company operates.	One-way ANOVA
Micro	Use of GRI guidelines	H_{0,13} : There is no relationship between the extent of ESG reporting by JSE-listed companies and subscribing to the GRI reporting guidelines.	Rank biserial correlation
		H_{0,14} : There is no difference between the extent of ESG reporting by JSE-listed companies subscribing to the GRI reporting guidelines and those who do not.	One-way ANOVA
	Being a UN Global Compact participant	H_{0,17} : There is no relationship between the extent of ESG reporting by JSE-listed companies and being a UN Global Compact participant.	Rank biserial correlation
		H_{0,18} : There is no difference between the extent of ESG reporting by JSE-listed companies which are UN Global Compact participants and those who are not.	One-way ANOVA

Business Environment	Independent variable	Relevant hypotheses to be tested	Test statistic used
Micro	Financial performance	$H_{0,21}$: There is no relationship between the extent of ESG reporting by JSE-listed companies and accounting-based financial performance.	Spearman correlation
		$H_{0,22}$: There is no relationship between the extent of ESG reporting by JSE-listed companies and market-based financial performance.	Spearman correlation
	Company size	$H_{0,25}$: There is no relationship between the extent of ESG reporting by JSE-listed companies and company size.	Spearman correlation
	Board composition (% NEDs)	$H_{0,27}$: There is no relationship between the extent of ESG reporting by JSE-listed companies and the composition of the companies' board of directors.	Could not be tested ^(a)
	Ownership concentration	$H_{0,28}$: There is no relationship between the extent of ESG reporting by JSE-listed companies and the level of ownership concentration.	Spearman correlation
(a) Owing to the nature of the data for board composition hypothesis $H_{0,27}$ could not be tested. There was inequality in the sample sizes between companies which had good and poor composition			

The researcher examined each independent variable to test the stated hypotheses. The Overall ESG score was used as the dependent variable. Owing to the nature of the data, nominal and ratio data as indicated in Table 1.2, influenced the selection of the statistical tests used to evaluate the research hypotheses.

The Overall ESG score and the two RI indices that were selected as the independent variables to be first tested. Table 5.9 presents the results of the statistical tests.

Table 5.9: Rank biserial and one-way ANOVA results: relationships and differences in RI indices for the JSE Sample

Variables	Rank biserial	Overall ESG mean scores		Current effect	One-way ANOVA	Levene's test for homogeneity	
		Excluded	Included			F	p
JSE SRI Index as on 31 Dec 2012	$r = 0.255$	4.294	5.264	$F(1,108) = 4.640$	$p = 0.030^*$	0.2105	0.6473
The Nedbank Green Index as on 31 Dec 2012	$r = 0.008^*$	4.840	4.870	$F(1,108) = 0.004$	$p = 0.950$	3.543	0.063

* Significant at the 5% confidence level

It is apparent from the results in Table 5.9, that there was no significant relationship between the JSE SRI Index and the Overall ESG score. It can be concluded, though, that there was a statistically significant difference between companies which were included and those excluded from the JSE SRI Index. Companies which were included in the JSE SRI Index had higher Overall ESG mean scores. Based on the findings, the researcher could not reject hypothesis $H_{0,1}$. However, hypothesis $H_{0,2}$ could be rejected.

The findings from Table 5.9 (based on the ANOVA) for the JSE SRI Index were to be expected based on literature reviewed in Chapter Three. Previous researchers claimed that companies included in a RI index would strive to meet the criteria set by the indices, and would therefore, produce better ESG reports than companies which were not included or did not aim to be included in an RI index (Ho, 2013:11; Collison *et al.*, 2008:19). The researcher concludes that responsible investors who value good ESG reporting should ensure to create their RI portfolios by focussing on JSE companies included in the JSE SRI Index.

The second RI index in Table 5.9, the Nedbank Green Index shows that a statistically significant positive relationship exists between the companies included in the Nedbank Green Index and the Overall ESG score. In contrast to the findings from the JSE SRI Index, no significant difference could be established between companies included and excluded from the Nedbank Green Index. Therefore, hypothesis $H_{0,3}$ is rejected, whereas hypothesis $H_{0,4}$ cannot be rejected.

The fact that a relationship was established between JSE-listed companies' Overall ESG score and their inclusion in the Nedbank Green Index could be because the RI index has stricter criteria for companies to be included. The Nedbank Green Index focuses exclusively on the environmental considerations of companies, while the JSE SRI Index gives attention to all three aspects of ESG. Looking back at the results in Table 5.5, the companies in the JSE sample generally rated higher on their Governance pillar than the Environmental pillar. This might explain why companies included and those excluded from the JSE SRI Index were found to be significantly different.

The next variable considered was the industry in which JSE-listed companies operated. Spearman's rank correlation coefficient was calculated to determine if a relationship existed between the industries' mean scores and the Overall ESG scores. The results were: $r = -0.15$ ($p = 0.12$). As no statistically significant relationship was observed, hypothesis $H_{0,11}$ could not be rejected. This finding is in contrast to the literature (for example Brammer & Pavelin, 2008:133; Halme & Huse, 1997:151) which found industry to be an important factor influencing non-financial reporting. Table 5.10 presents the findings from the statistical tests, one-way ANOVA, calculated for this independent variable.

Table 5.10: One-way ANOVA results: differences in the industry in which JSE-listed companies operated

Variables	Current effect	One-way ANOVA	Overall ESG mean: basic industries	Overall ESG mean: cyclical service	Overall ESG mean: financials	Overall ESG mean: non-cyclical consumer good	Overall ESG mean: resources
Industry in which JSE-listed companies operated	$F(4.86) = 6.731$	$p = <0.010^*$	3.76	6.35	5.12	5.00	2.93
1st - Mean		2nd - Mean		Mean - Difference		p	
Basic industries		Cyclical services		-2.590		0.001*	
Basic industries		Financials		-1.354		0.045*	
Basic industries		Non-cyclical consumer goods		-1.236		0.107	
Basic industries		Resources		0.833		0.243	
Cyclical services		Financials		1.236		0.080	
Cyclical services		Non-cyclical consumer goods		1.354		0.089	
Cyclical services		Resources		3.422		0.000*	
Financials		Non-cyclical consumer goods		0.118		0.860	
Financials		Resources		2.186		0.001*	
Non-cyclical consumer goods		Resources		2.069		0.004*	

* Significant at the 5% level

From Table 5.10, it can be seen that a statistically significant difference was found between the different industries. More specifically, the following differences existed:

- Basic industries (3.76) and cyclical services (6.35) – companies in cyclical services – achieved a higher mean score than companies in basic industries.
- Basic industries (3.76) and the financials (5.12) – the companies in the financial industry – had higher mean scores than companies in the basic industries as well.
- Cyclical services (6.35) and resources (2.93) – cyclical services companies – had higher mean scores than resources companies.
- Financials (5.12) and resources (2.93) – financial companies – also achieved higher mean scores than companies in the resources industry.
- Non-cyclical consumer goods (5.00) and resources (2.93) – non-cyclical consumer goods companies – had higher mean scores than resource companies.

The findings in Table 5.10 are in contrast to earlier discussions in the literature review, Section 3.5, in which companies in high-impact industries, such as basic industries and resources, were expected to produce higher quality non-financial reports on their ESG issues

and management of those considerations (Gasperini *et al.*, 2012:3). To conclude, hypothesis $H_{0,12}$ could be rejected as significant differences existed.

The next two variables investigated dealt with whether companies use the GRI guidelines and they were UN Global Compact participants. Table 5.11 presents the findings from the statistical tests.

Table 5.11: Rank biserial and one-way ANOVA results: relationships and differences in GRI and UN Global Compact for the JSE sample

Variables	Rank biserial	Overall ESG mean scores		Current effect	One-way ANOVA	Levene's test for homogeneity	
		Non-use	Use			F	p
The use of GRI guidelines as on 31 Dec 2012	$r = 0.245$	3.874	4.980	$F(1,108) = 2.521$	$p = 0.120$	0.103	0.749
		Non-participant	Participant				
UN Global Compact participant as on 31 Dec 2012	$r = 0.159$	4.749	5.441	$F(1,108) = 1.163$	$p = 0.280$	0.642	0.425

It is evident from Table 5.11 that no significant relationships or differences existed between any of the variables. Hypotheses $H_{0,13}$, $H_{0,14}$, $H_{0,17}$ and $H_{0,18}$ could thus not be rejected. Based on the literature review, companies which used the GRI guidelines were expected to produce higher quality ESG reports than those who did not (Global Reporting Initiative, 2013a). However, this was not found in the current research. The UN Global Compact was singled out for the many advantages it could bring to companies which are participants (United Nations Global Compact, 2013a). The researcher is perplexed by the empirical evidence. Perhaps companies which stated they used the GRI guidelines and were participants of the UN Global Compact, were not actually using these two initiatives to publish better non-financial reports.

Table 5.12 presents the different accounting and market-based financial performance measures used as independent variables in this study. Spearman's rank-order correlation coefficient was calculated for each variable. As outliers were found in the data Spearman's rank-order correlation coefficient was better suited than the Pearson correlation coefficient as it is less sensitive to outliers (Cooper & Schindler, 2011:276).

Table 5.12: Spearman's rank-order correlation coefficient results: relationships in financial performance measures for the JSE sample

Independent variable	N	Dependent variable	Spearman r	p
ROA as on 31 Dec 2012 ^(a)	99	Overall ESG score	-0.13	0.200
ROE as on 31 Dec 2012 ^(a)	99	Overall ESG score	0.09	0.380
EPS as on 31 Dec 2012 ^(a)	92	Overall ESG score	0.06	0.580
Total asset turnover as on 31 Dec 2012 ^(a)	104	Overall ESG score	0.10	0.300
MV/BV ratio as on 31 Dec 2012 ^(b)	104	Overall ESG score	0.09	0.350
HPR as on 31 Dec 2012 ^(b)	61	Overall ESG score	0.03	0.810
(a) Accounting-based financial performance measure.				
(b) Market-based financial performance measure.				

It can be seen from the results in Table 5.12, that there were no statistically significant relationships between any of the accounting and market-based financial performance measure and ESG reporting. Therefore, neither hypotheses $H_{0,21}$ or $H_{0,22}$ could be rejected. These findings are in contradiction to the majority of the academic literature, where positive relationships were found between a company's financial performance and non-financial reporting (Moneva & Ortas, 2010:195; Wingard & Vorster, 2001:327; Ullman, 1985:549). These findings may be caused by this study using financial data only for one year. This is one of the study's major limitations, as acknowledged in Section 1.9.

The remaining three independent variables for the JSE sample to be tested were a company's size and ownership concentration. Table 5.13 provides the statistical findings for these three variables which were calculated by means of the Spearman's rank-order correlation coefficient. Once again Spearman's rank-order correlation coefficient was used instead of the Pearson correlation coefficient because it is less sensitive to outliers (Cooper & Schindler, 2011:276).

Table 5.13: Spearman's rank-order correlation coefficient results: relationships in company size and ownership concentration for the JSE sample

Independent variable	Dependent variable	Spearman r	p
Size (market capitalisation) as on 31 Dec 2012	Overall ESG score	-0.04	0.720
Ownership concentration as on 31 Dec 2012	Overall ESG score	0.03	0.730

As observed in Table 5.13, no significant relationship existed between a company's Overall ESG score and its market capitalisation. Therefore, hypothesis $H_{0,25}$ could not be rejected. Previous studies which investigated the relationship between a company's size and its non-financial reporting did however, find a positive relationship between larger companies and

their level of reporting (Sonnenberg & Hamann, 2006:313). The researcher's finding is consequently in contrast to literature.

In terms of a company's ownership concentration, no significant relationship between the level of ownership concentration and the Overall ESG score was found. This leads the researcher failing to reject $H_{0,28}$. Previous studies by Brammer and Pavelin (2008:121) and Umlas (2008:1025) had also not found evidence of a relationship between non-financial reporting and ownership concentration. These authors' findings are in line with the researcher's findings in Table 5.13.

Table 5.14 presents a summary of the relevant hypotheses and the outcome for each independent variable examined in this study for the JSE sample.

The last research question was to examine which factors had an influence on the extent of ESG reporting by companies in the JSE sample in 2012. From Table 5.14, it can be concluded that the extent of ESG reporting companies in the JSE sample is positively associated with inclusion in the Nedbank Green Index, as this was the only relationship found. The Nedbank Green Index, as mentioned previously, focuses on the environmental concerns of companies only. This is interpreted as the ESG reporting by companies which are included in this index being positively influenced by their inclusion. Significant differences were observed between companies included in the JSE SRI Index and those excluded, as well as between different industries. Companies' scores in the resource industry were seen to be the worst in comparison with companies in the other industries.

Table 5.14: Summary of the hypotheses results for the JSE sample

Independent variable	Relevant hypotheses to be tested	Findings from test statistics
Inclusion in an RI index	H_{0,1} : There is no relationship between the extent of ESG reporting by JSE-listed companies and inclusion in the JSE SRI Index.	Fail to reject
	H_{0,2} : There is no difference between the extent of ESG reporting by JSE-listed companies included in the JSE SRI Index and those excluded from the index.	Reject
	H_{0,3} : There is no relationship between the extent of ESG reporting by JSE-listed companies and inclusion in the Nedbank Green Index.	Reject
	H_{0,4} : There is no difference between the extent of ESG reporting by JSE-listed companies and inclusion in the Nedbank Green Index.	Fail to reject
Industry	H_{0,11} : There is no relationship between the extent of ESG reporting by JSE-listed companies and the industry in which the company operates.	Fail to reject
	H_{0,12} : There is no difference between the extent of ESG reporting by JSE-listed companies and the industry in which the company operates.	Reject
Use of GRI guidelines	H_{0,13} : There is no relationship between the extent of ESG reporting by JSE-listed companies and subscribing to the GRI reporting guidelines.	Fail to reject
	H_{0,14} : There is no difference between the extent of ESG reporting by JSE-listed companies subscribing to the GRI reporting guidelines and those who do not.	Fail to reject
Being a UN Global Compact participant	H_{0,17} : There is no relationship between the extent of ESG reporting by JSE-listed companies and being a UN Global Compact participant.	Fail to reject
	H_{0,18} : There is no difference between the extent of ESG reporting by JSE-listed companies which are UN Global Compact participants and those who are not.	Fail to reject
Financial performance	H_{0,21} : There is no relationship between the extent of ESG reporting by JSE-listed companies and accounting-based financial performance.	Fail to reject
	H_{0,22} : There is no relationship between the extent of ESG reporting by JSE-listed companies and market-based financial performance.	Fail to reject
Company size	H_{0,25} : There is no relationship between the extent of ESG reporting by JSE-listed companies and company size.	Fail to reject
Board composition (% NEDs)	H_{0,27} : There is no relationship between the extent of ESG reporting by JSE-listed companies and the composition of the companies' board of directors.	Could not be tested^(a)
Ownership concentration	H_{0,28} : There is no relationship between the extent of ESG reporting by JSE-listed companies and the level of ownership concentration.	Fail to reject
(a) Owing to the nature of the data for board composition hypothesis H _{0,27} could not be tested. There was inequality in the sample sizes between companies which had good and poor composition		

5.4 SUMMARY AND CONCLUSIONS

This chapter presented the descriptive and inferential statistics conducted for the JSE sample. Firstly, there was a statistically significant difference between the three ESG pillars, especially Governance and Environmental, as well as Governance and Social. The statistical findings are supported by the descriptive results.

Secondly, it was observed that Governance considerations featured the most prominently amongst the companies in the JSE sample in 2012. As appeared several times throughout this study, the King III plays a vital role in this aspect of companies' non-financial reporting. The results from the study supported the discussions on King III's influence to promote transparency. In terms of the considerations needing more attention to, it was concluded that overall the Environmental and Social concerns of companies require improved reporting. More specifically, water stress (Environmental pillar) and health and safety (Social pillar) require more attention from companies in their ESG reports.

Thirdly, with regard to companies' ESG reporting measured by the Overall ESG score, from the relationships tested, only one of the 10 independent variables was observed to have a statistically significant relationship. The relationship was found between companies' inclusion in the Nedbank Green Index and the extent of their ESG reporting. This indicates that companies in this RI index produce better ESG reports owing to their inclusion on the index.

Lastly, significant results were found for differences between the dependent (Overall ESG score) and two of the five independent variables. The two independent variables were companies' inclusion in the JSE SRI Index and the type of industry in which companies operate. Companies included in the JSE SRI Index must ensure that their ESG reporting is at a level to meet the requirements of the index, which naturally leads those companies to have enhanced ESG reports than companies excluded. Based on the industry in which companies operate, it appears that the medium- and low-impact industries had better ESG reporting than the high-impact industries. This is somewhat in contrast to literature as discussed earlier, where high-impact industries were found to have greater ESG reports than companies in other industries.

In the next chapter, the empirical findings for the international Metals and Mining sample will be presented.

CHAPTER SIX

EMPIRICAL FINDINGS – METALS AND MINING SAMPLE

6.1 INTRODUCTION

In Chapter Five, the empirical findings for the JSE sample were presented. In this chapter, the empirical findings for the international Metals and Mining sample will be discussed.

The following research questions, applicable to the global Metals and Mining sample, will be answered in this chapter:

- Are there statistically significant differences among the three pillars of non-financial reporting in the international Metals and Mining sample?
- What are the main ESG issues that are reported on in the international Metals and Mining sample?
- Which aspects of ESG reporting by international Metals and Mining companies need more attention?
- Does ESG reporting by JSE-listed resource companies differ from that of Metals and Mining companies listed in other emerging and developed markets?
- Which factors influenced the extent of ESG reporting of international Metals and Mining companies in 2012?

6.2 DESCRIPTIVE STATISTICS

In this section, the descriptive statistics for the dependent and independent variables will be presented.

6.2.1 Dependent variable

The dependent variable for this study, as discussed in the previous chapters, was the Overall ESG score. In Table 6.1, the descriptive statistics of the dependent variable for the global Metals and Mining sample are provided. The same grouping system of mean scores used in Chapter Five was used in this section: zero \leq four as poor, four \leq seven as average, and seven \leq 10 as good. The criteria in Table 6.1 were listed from the highest to lowest mean scores.

Table 6.1: Descriptive statistics of the dependent variables for the Metals and Mining sample

Level of reporting	Criteria	N	Mean ^(a)	Standard Deviation	Min	Max
Overall ESG Score^(b)		173	3.239	2.245	0.0	10.0
Overall Environmental pillar Score		173	2.645	1.323	0.1	5.7
Environmental pillar	Water stress	89	4.150	1.817	0.3	8.3
	Carbon emissions	131	4.035	2.279	0.0	9.4
	Biodiversity and land use	173	2.231	1.686	0.0	6.3
	Toxic emissions and waste	173	2.186	1.390	0.0	5.5
	Insuring climate change risk	0	N/A	N/A	N/A	N/A
	Product carbon footprint	0	N/A	N/A	N/A	N/A
	Energy efficiency	0	N/A	N/A	N/A	N/A
	Raw material sourcing	0	N/A	N/A	N/A	N/A
	Financing environmental impact	0	N/A	N/A	N/A	N/A
	Packaging material and waste	0	N/A	N/A	N/A	N/A
	Electronic waste	0	N/A	N/A	N/A	N/A
	Opportunities in clean tech	0	N/A	N/A	N/A	N/A
	Opportunities in green building	0	N/A	N/A	N/A	N/A
Overall Social pillar Score		173	3.083	1.823	0.0	8.3
Social pillar	Labour management	79	4.692	2.356	0.0	10.0
	Health and safety	173	3.000	1.929	0.0	7.8
	Human capital development	0	N/A	N/A	N/A	N/A
	Supply chain labour	0	N/A	N/A	N/A	N/A
	Controversial sourcing	0	N/A	N/A	N/A	N/A
	Product safety and quality	0	N/A	N/A	N/A	N/A
	Chemical safety	0	N/A	N/A	N/A	N/A
	Financial product safety	0	N/A	N/A	N/A	N/A
	Privacy and data security	0	N/A	N/A	N/A	N/A
	Responsible investment	0	N/A	N/A	N/A	N/A
	Insuring health and demographic risk	0	N/A	N/A	N/A	N/A
	Opportunities in nutrition and health	0	N/A	N/A	N/A	N/A
	Access to communications	0	N/A	N/A	N/A	N/A
	Access to healthcare	0	N/A	N/A	N/A	N/A
	Access to finance	0	N/A	N/A	N/A	N/A
Overall Governance pillar Score		173	4.196	1.741	0.0	7.9
Governance pillar	Corporate governance ^(c)	171	6.389	2.459	0.0	10.0
	Anti-competitive practices	47	4.904	0.303	3.3	5.0
	Business ethics and fraud	63	4.870	0.350	3.3	5.0
	Corruption and instability	173	3.595	1.957	0.0	7.4
	Financial systems instability	0	N/A	N/A	N/A	N/A

(a) The Overall, individual ESG and sub-element scores were all calculated out of 10.
(b) The Industry-Adjusted Score calculated by MSCI was re-named to the Overall ESG Score by the researcher for this study.
(c) This criterion deals with board structure, shareholders rights, auditing practices and transparency or compensation (either transparency or compensation is used, depending on the industry in which the company operates in) (MSCI ESG Research, 2013f:44).

The Overall ESG score for the Metals and Mining companies was surprisingly low (3.24 out of 10). The researcher attributes this to the fact that these companies operate in a high-impact industry and face many ESG challenges (Gasperini *et al.*, 2012:3). It can be seen that many criteria have no rating. The MSCI ESG Research only considered the Key Issues identified as

being the most relevant for Metals and Mining companies in terms of ESG management and reporting (MSCI ESG Research, 2013a:30).

The low Overall ESG score and the individual pillar scores were unexpected as Metals and Mining companies have been identified in literature as being active reporters of non-financial information (Jenkins & Yakovleva, 2006). In two separate studies by De Villiers and Barnard (2000:21) and Jenkins and Yakovleva (2006:277), it was found that environmental reporting by metals and mining companies was extensive, yet the mean for the Environmental pillar in this study was the lowest of the three pillars (2.65).

As mentioned in Section 2.6, a decrease in environmental reports was identified because companies were concerned about the liability or litigation that might arise from the reports. However, in the study by Antonites and De Villiers (2003:2), resource companies were found to have increased environmental reporting. The researcher suggests that this may have changed as legislation changed over time and companies became wary of what they disclosed, for fear of drawing unwanted public attention.

The Governance pillar score obtained the highest mean (4.20) of the three pillar scores, despite the fact that not all countries have corporate governance codes, like the King III. The researcher concludes that reporting on governance considerations is the simplest to measure and report, such as the number of directors or women present on the board of directors. Environmental and Social concerns are more difficult to quantify.

The Overall ESG had a maximum score of 10, the Environmental pillar a maximum of 5.7, the Social pillar had a score of 8.3 and the Governance pillar had a maximum score of 7.9. As stated in Section 5.2.1, a maximum score of 10 indicates the highest possible level of reporting and transparency on specific issues based on the MSCI measurement instrument. The Overall ESG score, the Social and Governance pillar each had minimum values of zero, while the Environmental pillar had a minimum score of 0.1. A minimum score of zero, especially for Governance, is not an encouraging sign as this means that companies did not have adequate information disclosed in the non-financial reports.

In the Environmental pillar, in Table 6.1, companies achieved the highest mean score for water stress (4.15) in comparison with the other three criteria that are used as measurements for the Metals and Mining Environmental pillar score. This is in contrast to water stress being

the lowest Environmental pillar score for the JSE sample (2.77). This finding could be because the JSE sample comprises companies from various industries. When metals and mining companies are examined on their own, it appears that they are more conscious and do more regarding responsible water management and reporting.

Globally water as a resource has become a concern for companies and investors, and this is especially apparent in the metals and mining industry. This industry is known for its usage of large quantities of water and the pollution created, such as acid mine drainage (Carbon Disclosure Project, 2013:4; Chamber of Mines of South Africa, 2012:22). The demand by investors for more extensive information and initiatives like the CDP encourages companies to be more transparent regarding their water usage and reporting (Carbon Disclosure Project, 2013).

For the Social pillar, labour management had a higher mean score (4.69) than the only other criterion measured under the Social pillar, namely health and safety (3.00). Reasons why companies may have been rated lower for health and safety could be the many risks in this industry (Gasperini *et al.*, 2012:30). It could also be due to management's inability to contextualise the information to be disclosed in non-financial reports (Van Zyl, 2013:920). The researcher is of the opinion that it is easier for companies to manage and report on their labour risks, such as strikes, than it is to manage and report on health and safety considerations.

In terms of the Governance pillar, corporate governance in general (refer to footnote (c) in Table 6.1) was the criterion where companies achieved the highest score (6.39). This sample consisted of companies from 23 different countries where corporate governance policies most likely differ (Marocco, 2010:20; Klapper & Love, 2004:723). The lowest scored criterion was corruption and instability (3.60), which is similar to what was observed in the JSE sample. A reason corruption and instability is low, could be the mix of companies from emerging and developed countries in the sample. Not every country has strict legislation against corruption, and this leads to a country being deemed politically unstable.

Since the different criteria for the three pillars have been assessed for the highest and lowest mean scores, the researcher concludes that companies find it easier to measure and report on governance than on environmental and social concerns.

As indicated in Section 1.4.3 one of the research questions was determining if there were statistically significant differences among the three ESG pillars of non-financial reporting for the international Metals and Mining sample. Table 6.2 presents the findings from the one-way ANOVA.

Table 6.2: Inferential statistics for the three non-financial reporting pillars for the Metals and Mining sample

Variables	Mean score	Current effect	One-way ANOVA	Levene's test for homogeneity	
				F	p
Environmental Score	2.645	F(2, 344) = 76.244	p = 0.000*	76.244	0.000
Social Score	3.083				
Governance Score	4.196				
1st - Mean		2nd - Mean	Mean - Difference	p	
Environmental pillar		Social pillar	-0.439	0.001*	
Environmental pillar		Governance pillar	-1.551	0.000*	
Social pillar		Governance pillar	-1.112	0.000*	

* Significant at the 5% level

It is apparent from Table 6.2, that there was a statistically significant difference between all three pillar scores for the international Metals and Mining sample. Based on the findings, it can be concluded that the Social pillar score mean was higher than the Environmental pillar score, while the Governance pillar had a higher mean score than the Social and Environmental pillar scores. These findings are interpreted by the researcher as meaning that companies are reporting more adequately on their governance considerations than they are on their environmental and social concerns.

After examining the different criteria, the researcher identified companies in the international Metals and Mining sample with the lowest and highest Overall ESG and individual pillar mean scores. Table 6.3 presents the identified companies by name and country, as well as country status in which they operate. The purpose of Table 6.3 was to observe which companies were ranked the highest and lowest respectively

Table 6.3: Metals and Mining companies with the highest and lowest Overall ESG and individual pillar scores

	Score	Company	Country	Country status
Overall ESG score	Highest (10)	Boliden AB	Sweden	Developed
	Lowest (zero)	Beadell Resources Ltd.	Australia	Developed
		Pan American Silver Corp.	Canada	Developed
		Aluminum Corporation of China Ltd. China Coal Energy Company Ltd. China Molybdenum Co., Ltd. China Zhongwang Holdings Ltd. Inner Mongolia Yitai Coal Co., Ltd. Jiangxi Copper Company Ltd. Zhaojin Mining Industry Company Ltd. Zijin Mining Group Company Ltd.	China	Emerging
		Shougang Fushan Resources Group Ltd.	Hong Kong	Emerging
		Hindalco Industries Ltd.	India	Emerging
		Grupo Mexico, S.A.B. de C.V.	Mexico	Emerging
		OAO "Gorno-metallurgicheskaya kompaniya "Noril'skii nikel' "	Russia	Emerging
		Assore Ltd.	South Africa	Emerging
		Korea Zinc Co., Ltd.	South Korea	Developed
		Vedanta Resources plc	UK	Developed
		Southern Copper Corporation Coeur D'Alene Mines Corporation Hecla Mining Company	USA	Developed
Environmental pillar	Highest (5.7)	Lonmin PLC	South Africa	Emerging
	Lowest (0.10)	SunCoke Energy, Inc.	USA	Developed
Social pillar	Highest (8.3)	Boliden AB	Sweden	Developed
	Lowest (zero)	China Coal Energy Company Ltd. China Molybdenum Co., Ltd. China Zhongwang Holdings Ltd. Inner Mongolia Yitai Coal Co., Ltd. Jiangxi Copper Company Ltd. Zhaojin Mining Industry Company Ltd.	China	Emerging
		Shougang Fushan Resources Group Ltd.	Hong Kong	Emerging
		Assore Ltd. Harmony Gold Mining Company Ltd.	South Africa	Emerging
		Korea Zinc Co., Ltd.	South Korea	Developed
		Patriot Coal Corporation	USA	Developed
Governance pillar	Highest (7.9)	Cameco Corporation	Canada	Developed
	Lowest (zero)	Grupo Mexico, S.A.B. de C.V.)	Mexico	Emerging
		OAO "Gorno-metallurgicheskaya kompaniya "Noril'skii nikel' "	Russia	Emerging

Boliden AB from Sweden (a developed country) had the highest score for the Overall ESG and Social pillar. The highest rated company in the Environmental pillar was Lonmin in South Africa. It is a positive sign that an emerging market company achieved the highest score for environmental considerations. The highest Governance pillar score was achieved by a Canadian company, Cameco Corporation. As indicated in Table 6.3 Canada is considered a developed country.

The companies which achieved the lowest Overall ESG and Social pillar score were spread across developed and emerging countries. In line with the JSE sample, Assore Ltd. featured in this sample as well for having the lowest Overall ESG score. Assore Ltd. and Harmony Gold Mining Company Ltd. were again found to have some of the lowest Social scores, as was established from the JSE sample. Among all the emerging market countries, a number of companies in China had the lowest scores for the Overall ESG and Social Pillar. The lowest score for the Governance pillar were for two companies in Mexico and Russia, while a USA company had the lowest Environmental pillar score.

The results in Table 6.3 are not good indicators of ESG reporting in emerging countries despite having been acknowledged for improving their non-financial reporting (Lubin *et al.*, 2011:14; Marocco, 2010:11). Companies in emerging markets should strive to better their overall non-financial reporting, especially if they wish to attract the attention of RI investors.

The researcher is now in a position to answer two more research questions from Section 1.4.3, which are relevant to the international Metals and Mining sample. The first question sought to identify which ESG issues were predominantly reported on. Taking into consideration that not all the criteria were used in MSCI ESG Research's analysis, the researcher still concludes that Governance considerations are the main concerns reported on. This could be attributed to a similar finding from the JSE sample, where Van Zyl (2013:920) stated that governance concerns may be easier to disclose in non-financial reports than social and environmental issues are for companies.

The third research question aimed to uncover which aspects of ESG reporting by Metals and Mining companies need more attention. The Environmental and Social pillar scores for Metals and Mining companies were poor, while the Governance pillar score was average. The researcher concludes that all three pillars require greater attention. Companies need to do more to ensure that proper evaluations of the ESG risks and opportunities to the company are better identified, for them to be properly managed. Once this occurs, companies will be in a position to improve ESG reporting (Van Zyl, 2013:906). The next section will present the descriptive statistics for the independent variables of this study.

6.2.2 Independent variables

From Chapter Three, eight independent variables were identified for the international Metals and Mining sample. The descriptive statistics for the first five independent variables will be presented in Table 6.4.

Table 6.4: Sample sizes of the independent variables (FTSE4Good, legal system, country status, GRI and UN Global Compact) for the Metals and Mining sample

Independent variable	Status	Sample	
		N	%
FTSE4Good Index as on 31 Dec 2012	Companies excluded from index	165	95.38
	Companies included in the index	8	4.62
	Total	173	100.00
Legal system in a country	Common law	118	68.21
	Civil law	31	17.92
	Mixed law	24	13.87
	Total	173	100.00
Country status	Developed	124	71.67
	Emerging	49	28.33
	Total	173	100.00
BRICS classification	Non-BRICS	140	80.92
	BRICS	33	19.08
	Total	173	100.00
The use of GRI guidelines as on 31 Dec 2012	Non-use of GRI Guidelines	103	59.54
	Use of GRI Guidelines	70	40.46
	Total	173	100.00
Being a UN Global Compact participant as on 31 Dec 2012	Non-signatory to the UN Global Compact	143	82.66
	Signatory to the UN Global Compact	30	17.34
	Total	173	100.00

It is apparent from Table 6.4, that there were very few companies in the international Metals and Mining sample (4.62%) which were included in the FTSE4Good Index on 31 December 2012. The FTSE4Good Index consisted of 735 companies at year end (FTSE International Limited, 2012). It was unexpected that so few companies featured in this RI index, as the companies in the global Metals and Mining sample were classified as Best-in-Class companies by MSCI ESG Research (MSCI ESG Research, 2013a).

FTSE4Good generally excludes companies in the extraction of uranium specifically (FTSE, 2010b). As discussed in Section 3.2.3, the level of impact determines the criteria used by the FTSE4Good Index Series. The researcher interprets this as mining companies having stricter criteria to adhere to, and therefore, generally mining companies owing to the nature of their operations, are excluded.

As indicated in Section 3.3, there are three broad legal systems. Based on the legal system of the country in which companies have their operations, two thirds of the sample (68.21%), were operating in countries with a common law legal system, 17.92 per cent were operating in civil law countries, and the remaining 13.87 per cent were operating in mixed legal system countries.

From Table 6.4, it can be seen that, the country status classifications of the Metals and Mining sample were first divided between developed and emerging markets. Companies in developed countries represented more than two-thirds (71.67%) of the sample, while companies in emerging markets represented the rest. Even though there were more companies in developed markets that were analysed by MSCI ESG Research, this could change as investors' interest shifts from developed to emerging markets (MSCI ESG Research, 2013a:3; Marocco, 2010:11).

A fifth (19.08%) of the sample was classified as BRICS countries. Metals and mining companies in Brazil did not feature in the Metals and Mining sample on 31 December 2012. This was unexpected as Brazil has an extensive mining industry, similar to South Africa (Vives & Wadhwa, 2012:10). The BRICS classification was created to identify the largest emerging economies which would have substantial future investment opportunities for investors (BRICS Investments, 2013).

The next independent variable examined was the use of the GRI guidelines. From Table 6.4, it can be seen that 40.46 per cent of the Metals and Mining companies used the GRI guidelines. Of the companies using the guidelines, almost two thirds (62.86%) were in developed markets. The researcher is of the opinion that more Metals and Mining companies, in both developed and emerging markets, need to follow the GRI guidelines to improve their non-financial reporting.

The situation of being a UN Global Compact participant was examined next. For the Metals and Mining sample, only 17.34 per cent were participants of the UN Global Compact on 31 December 2012. Of these, slightly more than half (56.67%) were in developed countries, while 43.33 per cent were emerging market countries. Far more companies should become participants of the UN Global Compact, as the benefits outweigh the financial commitment linked to being a participant. As stated in Section 5.2.2, the contribution participants are asked to make is based on companies' annual revenue (United Nations Global Compact, 2014).

Additional descriptive statistics of the independent variables are presented in Table 6.5.

Table 6.5: Descriptive statistics of the independent variables for the Metals and Mining sample

Independent variable	Status	Dependent variable	N	Mean ^(a)	Standard Deviation	Min	Max
FTSE4Good Index as on 31 Dec 2012	Companies excluded from index	Overall ESG Score	165	3.082	2.132	0.0	8.3
		Environmental Score	165	2.568	1.284	0.1	5.4
		Social Score	165	3.015	1.787	0.0	7.7
		Governance Score	165	4.107	1.718	0.0	7.9
	Companies included in the index	Overall ESG Score	8	6.463	2.221	4.2	10.0
		Environmental Score	8	4.225	1.172	2.5	5.7
		Social Score	8	4.488	2.123	2.6	8.3
		Governance Score	8	6.028	1.127	3.9	7.6
	Total		173				
Legal system of companies in different countries	Common law	Overall ESG Score	118	3.380	2.100	0.0	8.3
		Environmental Score	118	2.496	1.319	0.1	5.4
		Social Score	118	3.142	1.756	0.0	7.7
		Governance Score	118	4.519	1.539	0.2	7.9
	Civil law	Overall ESG Score	31	2.767	2.741	0.0	10.0
		Environmental Score	31	2.719	1.301	0.3	5.1
		Social Score	31	2.903	2.127	0.0	8.3
		Governance Score	31	2.800	2.026	0.0	7.6
	Mixed law	Overall ESG Score	24	3.152	2.250	0.0	9.2
		Environmental Score	24	3.279	1.220	0.9	5.7
		Social Score	24	3.029	1.793	0.0	7.2
		Governance Score	24	4.405	1.428	1.4	6.9
	Total		173				
Country status	Developed market	Overall ESG Score	124	3.618	2.213	0.0	10.0
		Environmental Score	124	2.593	1.344	0.1	5.4
		Social Score	124	3.339	1.836	0.0	8.3
		Governance Score	124	4.591	1.510	0.7	7.9
	Emerging market	Overall ESG Score	49	2.279	2.050	0.0	6.8
		Environmental Score	49	2.776	1.272	0.3	5.7
		Social Score	49	2.437	1.636	0.0	5.5
		Governance Score	49	3.194	1.894	0.0	6.5
	Total		173				
BRICS classification	Non-BRICS	Overall ESG Score	140	3.546	2.206	0.0	10.0
		Environmental Score	140	2.644	1.337	0.1	5.4
		Social Score	140	3.330	1.775	0.0	8.3
		Governance Score	140	4.368	1.677	0.0	7.9
	BRICS	Overall ESG Score	33	1.935	1.947	0.0	6.8
		Environmental Score	33	2.645	1.283	0.3	5.7
		Social Score	33	2.036	1.669	0.0	5.5
		Governance Score	33	3.464	1.842	0.0	6.5
	Total		173				
The use of GRI guidelines as on 31 Dec 2012	Non-use of GRI Guidelines	Overall ESG Score	103	2.595	1.850	0.0	7.1
		Environmental Score	103	2.292	1.309	0.1	5.4
		Social Score	103	2.679	1.670	0.0	7.7
		Governance Score	103	3.753	1.678	0.0	7.0
	Use of GRI Guidelines	Overall ESG Score	70	4.186	2.446	0.0	10.0
		Environmental Score	70	3.163	1.172	0.4	5.7
		Social Score	70	3.679	1.886	0.0	8.3
		Governance Score	70	4.846	1.633	0.0	7.9
	Total		173				

Independent variable	Status	Dependent variable	N	Mean ^(a)	Standard Deviation	Min	Max
Being a UN Global Compact participant as on 31 Dec 2012	Non-participant of the UN Global Compact	Overall ESG Score	143	2.986	2.121	0.0	8.3
		Environmental Score	143	2.483	1.302	0.1	5.4
		Social Score	143	2.936	1.817	0.0	7.7
		Governance Score	143	4.026	1.715	0.0	7.9
	Participant of the UN Global Compact	Overall ESG Score	30	4.442	2.461	0.0	10.0
		Environmental Score	30	3.413	1.159	1.1	5.7
		Social Score	30	3.783	1.711	0.6	8.3
		Governance Score	30	5.004	1.658	1.5	7.6
	Total		173				
Ownership concentration as on 31 Dec 2012	Companies with below average concentration	Overall ESG Score	85	2.704	2.029	0.0	8.3
		Environmental Score	85	2.489	1.314	0.3	5.1
		Social Score	85	2.799	1.702	0.0	6.8
		Governance Score	85	3.818	1.778	0.0	7.3
	Companies with above average concentration	Overall ESG Score	67	4.002	2.450	0.0	10.0
		Environmental Score	67	2.893	1.404	0.1	5.7
		Social Score	67	3.385	1.953	0.0	8.3
		Governance Score	67	4.779	1.555	0.2	7.9
	Total		152				
a) The Overall and individual pillar score were all calculated out of 10.							

Companies which featured in the FTSE4Good Index achieved a higher Overall ESG (6.46) mean score, as well as all three pillars, than companies which were excluded (Overall ESG score 3.08) from this index. This could be due to the fact that companies have to adhere to specific ESG reporting requirements to be included and remain in the index (FTSE, 2010b). The researcher will test if the difference between inclusion and exclusion of the RI index is significant (Table 6.9).

In the literature reviewed on the different legal systems in Section 3.3, the researcher noted that companies in civil law countries were more likely to produce integrated reports than companies in the other legal systems, particularly common law countries (Frías-Aceituno *et al.*, 2012:47). From the three legal systems in Table 6.4, companies in common law countries achieved the highest mean score (3.38), followed by companies in mixed legal system countries (3.15). Companies in civil law countries had the lowest Overall ESG mean score (2.77). This finding is in contrast to the literature, as mentioned earlier, on non-financial reporting and legal systems (Frías-Aceituno *et al.*, 2012:47). The highest Social and Governance pillar scores were achieved by companies in common law countries. Companies in a mixed legal system achieved the highest Environmental pillar score. Companies in the civil law countries had the lowest mean scores for the Social and Governance pillars, but had a higher Environmental pillar score than companies in common law countries.

Companies operating in developed countries had a higher Overall ESG score (3.62) than companies in emerging markets (2.28). The researcher compared the individual pillar scores

and noticed that, emerging market companies had a higher Environmental score (2.78) than companies in developed countries (2.59). The companies in developed countries had higher Social and Governance pillar mean scores than companies in emerging markets. These results are substantiated in literature as found by Park and Kowal (2011:4) who found that emerging market companies focused more on environmental issues in their ESG reports, than on social and governance concerns. The level of environmental reporting was claimed to be almost along the lines of developed country companies' reporting levels (Park & Kowal, 2011:4).

For the BRICS classification, companies which were in non-BRICS countries achieved higher Overall ESG Score (3.55) than BRICS companies (1.94). It was observed however, that for the Environmental pillar score, non-BRICS (2.64) and BRICS (2.65) companies achieved almost similar scores. For the Social and Governance pillar score, non-BRICS companies scored higher mean scores than BRICS companies. As discussed previously, companies in emerging markets were found not to report as extensively on social and governance considerations, as they do for environmental concerns (Park & Kowal, 2011:4). This can be observed with the BRICS classification as well.

The GRI guidelines were the next independent variable to be examined. Companies which used the GRI guidelines (40.46%) achieved higher Overall ESG score and individual ESG pillar scores than companies which did not use the GRI guidelines. This finding is similar to that for the JSE sample. As stated then, this is a positive sign for the GRI as this may indicate that companies are becoming more aware and taking action regarding ESG concerns owing to the use of the guidelines.

In Table 6.5, the researcher observed that companies which are participants of the UN Global Compact (17.34%) also achieved higher Overall ESG and individual pillar scores in comparison with companies which were not participants. These results are similar to those for the GRI guidelines.

As discussed in Sections 3.5 and 3.6, there are advantages to these initiatives. Companies are assisted in reporting on areas of concern internationally, and have access to knowledge on industry-specific issues to improve the company's operations and ESG reporting (Global Reporting Initiative, 2013a; United Nations Global Compact, 2013c).

Ownership concentration is the last independent variable for the international Metals and Mining sample in Table 6.5. As in the JSE sample, the ownership concentration acceptable level was determined based upon the average of the sample. It was observed that companies with an above-average ownership concentration achieved higher mean scores for the Overall ESG and all three individual pillar scores. This showed that companies with greater levels of ownership concentration have better ESG reporting. The enhanced ESG reporting could be due to pressure being placed on the company by shareholders (Brammer & Pavelin, 2008:124).

Descriptive statistics for the remaining independent variables, accounting and market-based financial performance and company size, is presented in Table 6.6. The dataset for the financial performance measures and company size based on market capitalisation also contained a few outliers like the JSE sample.

Table 6.6: Descriptive statistics for the remaining independent variables for the Metals and Mining sample

Independent variables	N	Mean	Median	Standard Deviation	Min	Max
ROA as on 31 Dec 2012 ^(a) (%)	151	0.960	3.070	14.546	-68.850	28.970
ROE as on 31 Dec 2012 ^(a) (%)	150	-1.399	5.265	40.495	-368.940	43.100
EPS as on 31 Dec 2012 ^(a) (US Dollars)	101	1.378	0.543	3.018	0.002	27.727
Total asset turnover as on 31 Dec 2012 ^(a) (times)	147	0.591	0.429	0.860	0.000	1.659
MV/BV as on 31 Dec 2012 ^(b) (times)	147	2.041	1.377	2.429	-0.029	22.314
HPR as on 31 Dec 2012 ^(b) (US Dollars)	73	0.106	0.114	0.253	-0.486	0.678
Size (market capitalisation) as on 31 Dec 2012 (US Dollars)	149	6 063 088.42	1 548 419.75	14 073 514.17	18 017.74	114 143 424.64
(a) Accounting-based financial performance measure.						
(b) Market-based financial performance measure.						

In Table 6.6, it can be seen that the mean for ROE was negative and the remaining accounting-based financial performance measures means were quite low. There was also a very low HPR mean. In the next section, the inferential statistics for the international Metals and Mining sample will be presented.

6.3 INFERENCE STATISTICS

This section will present the inferential statistics for the international Metals and Mining sample. One of the important research questions from Section 1.4.3 deals with whether ESG reporting by JSE-listed resource companies differs from that of Metals and Mining companies listed in other emerging and developed markets. To answer this research question, Table 6.7 presents the results from the one-way ANOVA that was calculated.

Table 6.7: One-way ANOVA results: differences in the developed, South African and other emerging market companies in the international Metals and Mining sample

Variables	Overall ESG mean score	Current effect	One-way ANOVA	Levene's test for homogeneity	
				F	p
South Africa	3.083	F(2, 170) = 8.798	p = <0.010*	1.397	0.250
Other emerging markets	1.813				
Developed	3.618				
1st - Mean		2nd - Mean		Mean - Difference	
				p	
South Africa		Other emerging markets		1.270	
South Africa		Developed markets		-0.535	
Other emerging markets		Developed markets		-1.805	
				0.048*	
				0.325	
				0.000*	

* Significant at the 5% level

From Table 6.7, it is clear that there were two statistically significant differences. South African resource companies achieved a higher Overall ESG mean score than the metals and mining companies in other emerging markets. The results could be interpreted as South African resource companies being better at ESG reporting than companies in other emerging markets. This finding is in line with previous studies on emerging countries (Park & Kowal, 2011:3; Social Investment Forum, 2009:5). Metals and Mining companies in developed markets had a higher Overall ESG mean score than other emerging market resource companies. This finding was to be expected as companies in developed countries tend to have better more guidelines in place for enhanced ESG reporting than companies in some emerging markets.

It is interesting to note from Table 6.7 that South African and developed market companies did not show any significant difference in the Overall ESG score from the data available. It has been acknowledged in literature (Social Investment Forum, 2009:5), that South African companies have been publishing a higher standard of ESG reports than many companies,

especially in other emerging markets. The results from this test statistic concur with the literature. The hypotheses in Table 6.8 were extracted from the literature review in Chapter Three, as these were relevant to the global Metals and Mining sample.

Table 6.8: Hypotheses relating to the international Metals and Mining sample

Environment	Independent variable	Relevant hypotheses to be tested	Test statistic used
Macro	Inclusion in an RI index	H_{0,5}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and inclusion in the FTSE4Good Index Series.	Rank biserial correlation
		H_{0,6}: There is no difference between the extent of ESG reporting by Metals and Mining companies and inclusion in the FTSE4Good Index Series.	One-way ANOVA
	Legal system in a country	H_{0,7}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and the type of legal system of the country where the company has its primary listing.	Polyserial correlation
		H_{0,8}: There is no difference between the extent of ESG reporting and the type of legal system of the country where Metals and Mining companies have their primary listing.	One-way ANOVA
	Country status	H_{0,9}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and the status of the country where the company has its primary listing.	Polyserial correlation
		H_{0,10}: There is no difference between the extent of ESG reporting and the status of the country where Metals and Mining companies have its primary listing.	One-way ANOVA
Micro	Use of GRI guidelines	H_{0,15}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and subscribing to the GRI reporting guidelines.	Rank biserial correlation
		H_{0,16}: There is no difference between the extent of ESG reporting by Metals and Mining companies subscribing to the GRI reporting guidelines and those who do not.	One-way ANOVA
	Being a UN Global Compact participant	H_{0,19}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and being a UN Global Compact participant.	Rank biserial correlation
		H_{0,20}: There is no difference between the extent of ESG reporting by Metals and Mining companies which are UN Global Compact participants and those who are not.	One-way ANOVA
	Financial performance	H_{0,23}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and accounting-based financial performance.	Spearman correlation
		H_{0,24}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and market-based financial performance.	Spearman correlation
	Company size	H_{0,26}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and company size.	Spearman correlation
	Ownership concentration	H_{0,29}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and ownership concentration.	Spearman correlation

Each independent variable will be examined to test the stated hypotheses. As with the JSE sample, the Overall ESG score was used in the statistical tests as the hypotheses were constructed to test the extent of ESG reporting and the independent variable identified in Chapter Three. The first independent variable to be tested was the companies' inclusion in the FTSE4Good Index Series (Table 6.9).

Table 6.9: Rank biserial and one-way ANOVA results: relationship and differences in FTSE4Good for the international Metals and Mining sample

Variables	Rank biserial	Overall ESG mean scores		Current effect	One-way ANOVA	Levene's test for homogeneity	
		Excluded	Included			F	p
FTSE4Good Index on 31 Dec 2012	$r = 0.685$	3.082	6.463	$F(1,171) = 19.110$	$p = <0.010^*$	0.001	0.972

* Significant at the 5% confidence level

There was no statistically significant relationship, but there was a significant difference between companies included in the FTSE4Good Index and those which were excluded. Companies which were included in the RI index had a substantially higher Overall ESG mean score than those which were excluded. Therefore, hypothesis $H_{0,5}$ could not be rejected, whereas hypothesis $H_{0,6}$ could be rejected.

From the literature it was established that companies which aimed to be included in the FTSE4Good Index had to meet the criteria that the index set out, and considering that many of these criteria are on ESG concerns, it was to be expected that companies included in the RI index would have better ESG reports than companies which were excluded from the index (FTSE, 2010b; Collison *et al.*, 2009:39). This implies that companies which are included in RI indices have better ESG reports than companies which are excluded. Therefore, responsible investors will probably be more interested in those companies which are included in an RI index.

The next independent variable considered was the legal system of a country in which Metals and Mining companies operated. A polyserial correlation was computed to determine if there was a statistically significant relationship between the companies' ESG reporting and the legal system of the country in which they had their primary listing. The result was: $r = -0.084$ ($p = > 0.05$) and hypothesis $H_{0,7}$ could not be rejected. Table 6.10 presents the findings from

the one-way ANOVA test conducted to test for the differences between companies from countries with different legal systems.

Table 6.10: One-way ANOVA results: differences in legal system in a country for the international Metals and Mining sample

Variables	Overall ESG mean score	Current effect	One-way ANOVA	Levene's test for homogeneity	
				F	p
Common law	3.380	F(2.170) = 0.934	p = <0.390	3.063	0.049
Civil law	2.767				
Mixed law	3.152				
1st - Mean		2nd - Mean	Mean - Difference	p	
Common law		Civil law	0.6128	0.1783	
Common law		Mixed law	0.2279	0.6511	
Civil law		Mixed law	-0.3849	0.5294	

There were no statistically significant differences in the data examined. In other words, there was no difference in international Metals and Mining companies ESG reporting between the different legal systems. These findings are in contrast to literature, which found that companies that operate in a country which has a sophisticated legal system will tend to produce better ESG reports than companies in a country with a weak legal system (Frías-Aceituno *et al.*, 2012:46-47). To conclude, hypothesis H_{0,8} could not be rejected.

The status of a country in which Metals and Mining companies operate was the next independent variable to be statistically investigated. The suitable test statistic chosen was the rank biserial and a one-way ANOVA, as presented in Table 6.11.

Table 6.11: Rank biserial and one-way ANOVA results: relationships and differences in country status for the international Metals and Mining sample

Variables	Rank biserial	Overall ESG mean scores		Current effect	One-way ANOVA	Levene's test for homogeneity	
		Emerging	Developed			F	p
Country status	r = 0.358	2.279	3.618	F(1,171) = 13.378	p = <0.010*	0.066	0.797
		Non-BRICS	BRICS				
BRICS classification	r = -0.407	3.546	1.936	F(1,171) = 14.841	p = <0.010*	0.390	0.533

* Significant at the 5% confidence level

It is evident (Table 6.11) that no statistically significant relationship existed between ESG reporting and country status. However, a statistically significant difference was apparent between companies' Overall ESG mean score for those operating in developed markets (3.62) and those in emerging markets (2.28). There was also a significant difference between the Overall ESG mean score for companies which were in BRICS countries and those that were not. Hypothesis $H_{0,9}$ could not be rejected and $H_{0,10}$ can be rejected based on the test statistics.

Companies in emerging markets were acknowledged in a number of studies for improvements in their ESG reports, especially in comparison of companies in developed markets (Lubin *et al.*, 2011:14; Park & Kowal, 2011:4). However, companies in emerging markets need to do more in improving their published ESG reports because there is a contradiction between the findings and literature reviewed.

The following independent variables examined were, the use of the GRI guidelines by companies and whether or not companies were UN Global Compact participants on 31 December 2012. Table 6.12 presents the results from the test statistics conducted.

Table 6.12: Rank biserial and one-way ANOVA results: relationships and differences in GRI and UN Global Compact for the international Metals and Mining sample

Variables	Rank biserial	Overall ESG mean scores		Current effect	One-way ANOVA	Levene's test for homogeneity	
		Non-use	Use			F	p
The use of GRI guidelines as on 31 Dec 2012	$r = 0.441$	2.595	4.186	$F(1,171) = 23.695$	$p = <0.010^*$	7.642	0.006
		Non-participant	Participant				
UN Global Compact participant as on 31 Dec 2012	$r = 0.363$	2.986	4.442	$F(1,171) = 11.038$	$p = <0.010^*$	0.830	0.364

* Significant at the 5% confidence level

There was no significant relationship between ESG reporting and the use of GRI guidelines. Therefore, hypothesis $H_{0,15}$ could not be rejected. There was however, a statistically significant difference between the Overall ESG score and the use of the GRI guidelines. The Metals and Mining companies which used the guidelines had a significantly higher Overall ESG mean score than companies which did not make use of the guidelines. Hypothesis $H_{0,16}$ could therefore be rejected.

For the UN Global Compact, it can be seen that there was also, like the GRI guidelines, no relationship between companies being participants to the UN Global Compact and their ESG reporting. As such, hypothesis $H_{0,19}$ could not be rejected. From the one-way ANOVA, it was observed that there was a significant difference between Metals and Mining companies which were UN Global Compact participants and those which were not. Metals and Mining companies which were participants had higher Overall ESG mean scores than companies which did not participate. Therefore, hypothesis $H_{0,20}$ could be rejected.

The findings from Table 6.12 were expected, unlike the results from the JSE sample. Metals and Mining companies have been described as companies which tend to publish better ESG reports where companies have used GRI guidelines (Sonnenberg & Hamann, 2006:311). The results from Table 6.12 emphasises that these initiatives (GRI and UN Global Compact) are important for companies to improve their ESG reporting.

Financial performance was divided into accounting and market-based financial performance measures, as in Section 5.3. Table 6.13 provides the results for the different financial performance measures. The Spearman's rank-order correlation coefficient was the most appropriate statistic to use, as outliers were present in the data.

Table 6.13: Spearman's rank-order correlation coefficient results: relationships in financial performance measures for the international Metals and Mining sample

Independent variable	N	Dependent variable	Spearman r	p
ROA as on 31 Dec 2012 ^(a)	151	Overall ESG score	0.02	0.840
ROE as on 31 Dec 2012 ^(a)	150	Overall ESG score	0.03	0.720
EPS as on 31 Dec 2012 ^(a)	101	Overall ESG score	0.23	0.020*
Total asset turnover as on 31 Dec 2012 ^(a)	147	Overall ESG score	0.03	0.740
MV/BV as on 31 Dec 2012 ^(b)	147	Overall ESG score	0.09	0.270
Holding Period Return as on 31 Dec 2012 ^(b)	73	Overall ESG score	0.06	0.640
(a) Accounting-based financial performance measures.				
(b) Market-based financial performance measures.				

* Significant at the 5% level

In terms of the accounting-based performance measures, only one significant relationship is observed between companies' EPS and Overall ESG mean score. Given that there was only one significant relationship (out of four), hypothesis $H_{0,23}$ could not be rejected. From the market-based financial performance measures, no statistically significant relationship was found. Therefore, hypothesis $H_{0,24}$ could also not be rejected. As stated previously in the discussion for Table 5.12, these findings and the literature are in contradiction of each other.

The last two independent variables investigated for the international Metals and Mining sample were company's size and ownership concentration. Table 6.14 presents the findings from the Spearman's rank-order correlation coefficient calculated for each variable.

Table 6.14: Spearman's rank-order correlation coefficient results: relationships in company size and ownership concentration for the Metals and Mining sample

Independent variable	Dependent variable	Spearman r	p
Size (market capitalisation) as on 31 Dec 2012	Overall ESG Score	0.22	0.010*
Ownership concentration as on 31 Dec 2012	Overall ESG Score	0.23	0.005*

* Significant at the 5% level

It is evident from Table 6.14, that there was a statistically significant relationship between the Overall ESG score and the company's size based on market capitalisation. Hypothesis $H_{0,26}$ could be rejected. This finding is supported by literature which stated that larger companies tended to produce higher quality ESG reports than smaller companies (Brammer & Pavelin, 2008:124).

There was a statistically significant relationship between a company's Overall ESG score and the ownership concentration. Therefore, hypothesis $H_{0,29}$ can be rejected. The results from this study are in line with Cullen and Christopher (2002:52), who found a significant association between ownership concentration and non-financial reporting.

Table 6.15 presents a summary of the relevant hypotheses and the outcome for each independent variable examined in this study for the international Metals and Mining sample.

Table 6.15: Summary of the hypotheses results for the international Metals and Mining sample

Independent variable	Relevant hypotheses to be tested	Findings from the test statistics
Inclusion in an RI index	H_{0,5}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and inclusion in the FTSE4Good Index Series.	Fail to reject
	H_{0,6}: There is no difference between the extent of ESG reporting by Metals and Mining companies and inclusion in the FTSE4Good Index Series.	Reject
Legal system in a country	H_{0,7}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and the type of legal system of the country where the company has its primary listing.	Fail to reject
	H_{0,8}: There is no difference between the extent of ESG reporting and the type of legal system of the country where Metals and Mining companies have their primary listing.	Fail to reject
Country status	H_{0,9}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and the status of the country where the company has its primary listing.	Fail to reject
	H_{0,10}: There is no difference between the extent of ESG reporting and the status of the country where Metals and Mining companies have its primary listing.	Reject
Use of GRI guidelines	H_{0,15}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and subscribing to the GRI reporting guidelines.	Fail to reject
	H_{0,16}: There is no difference between the extent of ESG reporting by Metals and Mining companies subscribing to the GRI reporting guidelines and those who do not.	Reject
Being a UN Global Compact participant	H_{0,19}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and being a UN Global Compact participant.	Fail to reject
	H_{0,20}: There is no difference between the extent of ESG reporting by Metals and Mining companies which are UN Global Compact participants and those who are not.	Reject
Financial performance	H_{0,23}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and accounting-based financial performance.	Fail to reject
	H_{0,24}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and market-based financial performance.	Fail to reject
Company size	H_{0,26}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and company size.	Reject
Ownership concentration	H_{0,29}: There is no relationship between the extent of ESG reporting by Metals and Mining companies and ownership concentration.	Reject

The last research question was to determine which factors had an influence on the extent of ESG reporting by companies in the international Metals and Mining sample in 2012. Only two independent variables (size and ownership concentration) had a positive association with ESG reporting as demonstrated by the Overall ESG score. The size of a company, as mentioned previously, had been found to positively influence non-financial reporting (Brammer & Pavelin, 2008:124). ESG reporting by larger companies will be better than the reports published by smaller companies.

In terms of ownership concentration, identifying that it was an influencing factor is encouraging as Halme and Huse (1997:152) suggested that ownership concentration would have an effect, but did not find one in their study. This finding implies that the greater a company's ownership concentration is, the better its ESG reports are.

6.4 SUMMARY AND CONCLUSIONS

This chapter presented the descriptive and inferential statistics for the international Metals and Mining sample on 31 December 2012. First, there was a statistically significant difference between the three pillars of ESG reporting. The Governance pillar was found to have a higher mean score than the Social and Environmental pillar. The Social pillar also achieved a higher mean score than the Environmental pillar score. These findings can be linked to the descriptive findings discussed previously.

Second, the researcher concluded that Governance considerations were the most prominently reported on by Metals and Mining companies internationally. This finding is similar to what was found in the overall JSE sample. As with the JSE sample, a reason for companies publishing more Governance considerations could be accounted for by the ability for companies to measure the governance concerns more easily into ESG reports than the other pillars. In terms of the other two pillars, Social and Environmental, it was surmised that these two require much more attention in terms of reporting. Even though Governance considerations were reported on more than the other two pillars, the researcher suggests that Governance pillar could also receive more attention from management.

The next main finding was a statistically significant difference between South African Metals and Mining companies and companies in other emerging markets. However, companies which operate in develop markets achieved better Overall ESG mean scores than companies

in emerging markets. This was concluded by the researcher because South African companies are better at publishing ESG reports than companies in other emerging markets, as literature has stated.

The last critical findings are related to the relationships and differences tested for as influencing factors of ESG reporting. With regard to companies' ESG reporting measured by the Overall ESG score, there were two relationships found from the nine independent variables. The relationships were found between companies' ESG reporting and the company size and ownership concentration. This reveals that the larger the company and the greater the ownership concentration, the better a company's ESG reporting will be.

Lastly, significant differences between the dependent and independent variables were found amongst four of the five. The four independent variables were companies' inclusion in the FTSE4Good Index Series, companies' operating in developed countries, the use of GRI guidelines, and companies being participants of the UN Global Compact.

These findings imply that companies which are included in the FTSE4Good Index Series have better ESG reports than companies excluded from the RI index. This could be because companies included in the index had to meet strict ESG criteria which lead to companies having better ESG reports. Companies which operate in developed countries were found to have greater ESG reports than companies in emerging countries. This result could be related to responsible investors in developed countries expecting more information disclosed.

Finding that companies which use the GRI guidelines have more comprehensive ESG reports than companies which do not use the guidelines are a positive sign. The GRI guidelines are in place to improve reporting. Therefore, it can be seen statistically that they are achieving their aim. The participants of UN Global Compact having better ESG reporting than those which are not is another good sign as this initiative is aimed at integrating the ESG considerations into business operations and therefore, reporting. These findings imply that the UN Global Compact initiative is reaching its objective.

In the next chapter, a summary, conclusions and recommendations will be presented.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

In the previous chapter, the empirical findings of the international Metals and Mining sample were presented. In this chapter the main findings of this study, along with pertinent conclusions and recommendations, will be provided. This will be followed by a reconciliation of the research objectives and a discussion on the possible limitations of the study. Suggestions for future research will also be put forward.

The study's problem statement was partly based on the fact that limited academic research had been conducted on ESG reporting in South Africa. This is despite the country being a pioneer in integrated reporting. As discussed previously, ESG reporting represents the non-financial reporting component of a company's integrated report. The majority of early studies completed in South Africa focused almost exclusively on environmental reporting, and disclosure of corporate governance practices. As far as could be established, no other single academic study has focused exclusively on all three elements of ESG reporting in South Africa.

A review of the literature also revealed that very little research had been conducted on ESG reporting in the metals and mining industry. Although this industry makes a positive contribution to job creation and economic development, it has a bad track record in terms of its impact on the natural environment and the people. The environmental risks in the metals and mining industry include pollution-created ones such as acid mine drainage, and the use of large quantities of water. The health and safety risks associated with working in this industry include employees' risk of HIV/AIDS, injury or death. This industry was chosen as it had been stated that companies in high-impact industries, such as this one, should be publishing comprehensive ESG reports for their stakeholders' benefit (Gasperini *et al.*, 2012:30).

The primary research objective (as formulated in Section 1.4.1) was twofold. Firstly, it was to investigate the extent of ESG reporting in South Africa and in a sample of international Metals and Mining companies. Secondly, it was to evaluate the factors that could potentially influence ESG reporting in South Africa and in the international Metals and Mining industry.

The secondary research objectives from Section 1.4.2 were:

- To conduct a thorough literature review on the key constructs of the study, namely ESG reporting, RI indices, legal system, country status, industry, GRI, UN Global Compact, financial performance, company size, board composition and ownership concentration.
- To select a suitable research design and methodology for the study.
- To collect and analyse relevant secondary data.
- To provide pertinent conclusions and recommendations derived from the findings of the study.

In this study, quantitative secondary data were collected and analysed for the year 2012. The datasets consisted of nominal and ratio data which were sourced from MSCI ESG Research, Bureau van Dijk, FTSE Client Services, the JSE's website, the Nedbank Green Index website, the US CIA World Factbook, the World Bank Classification, the GRI Sustainability Disclosure database, and the UN Global Compact website. Descriptive statistics were completed to gain a better understanding of the data. Inferential statistics were computed to test the hypotheses formulated in Chapter Three. Attention was given to the criteria for good research, namely reliability, validity and generalisability.

7.2 MAIN FINDINGS FROM THE LITERATURE REVIEW

From the literature reviewed in Chapters Two and Three, the researcher deduced that there is some confusion surrounding the name of the phenomenon; sometimes it is referred to as sustainability reporting, other times ESG reporting or integrated reporting. In this study, ESG reporting was seen as representing the non-financial reporting component in an integrated report. In addition, the researcher viewed ESG reporting as a proxy for ESG management.

The researcher noted a progression over time from reporting only on environmental issues to reporting on the full spectrum of ESG considerations. A certain level of sophistication has developed over time as more criteria and guidelines on measuring ESG considerations were developed. Such development has been in the form of the King reports, the IIRC, the GRI guidelines and the UN Global Compact, all of which aim, in some form or another to improve non-financial reporting. There is also evidence that reporting on ESG concerns has increased over time, especially in South Africa (Ernst & Young, 2014:28; Gstraunthaler, 2010:148). Although the quantity of ESG reports is growing, the 'level of integration' of ESG concerns into integrated reports is still low (Van Zyl, 2013:921).

Given growing interest in the phenomenon, many researchers have set out to investigate the factors influencing ESG reporting. The most prominent of these factors were: being listed in an RI index; the legal system of a country and the status of the country in which companies operate; the industry in which companies operate; the use of GRI guidelines; being a participant of the UN Global Compact; companies' financial performance and size; and a company's board composition and ownership concentration. These factors formed the foundation of the null hypotheses tested in this study.

The literature review showed that there are many benefits associated with ESG reporting. The main benefits for shareholders and other stakeholders include reduced information asymmetry and increased transparency. For companies, there are further benefits linked with ESG reporting, such as avoidance of future litigation and fines; improved access to capital; protection of company's reputation, and enhanced legitimacy of business operations.

ESG reporting is, however, not without its challenges. The most pertinent of these difficulties for stakeholders involve the reliability of the ESG data and the quantification of ESG issues. The challenges for companies, on the other hand, appear to be uncertainty regarding how to standardise ESG reports and how to overcome their predisposition to not produce ESG reports. Companies' predisposition stems from their fear of public scrutiny and possible negative publicity. Being perceived as socially conscious through the non-financial reports disclosed also creates pressure on companies.

7.3 MAIN FINDINGS FROM THE EMPIRICAL INVESTIGATION

In this section, the main findings from the empirical investigation will be presented. The discussion starts with the JSE sample, followed by the international Metals and Mining sample.

7.3.1 Empirical findings from the JSE sample

The Overall ESG mean scores for the JSE sample ($n = 110$) was classified as average (4.85 out of 10). The researcher was expecting a higher Overall ESG mean score for this sample because the literature identified South Africa as one of the pioneers in ESG reporting globally. The Governance pillar score had the highest mean score (6.06), followed by the Social pillar score (4.92) and the Environmental pillar score (4.48). A one-way ANOVA

showed that there was a statistically significant difference between the three individual pillar scores. This finding was not surprising given the prominence of the King reports on corporate governance in South Africa. This finding is also in line with other local research on the relative importance of ESG concerns (Giamporcaro & Pretorius, 2012; Eccles, De Jongh, Ndlovu, Coovadia & Smith, 2009).

Only one statistically significant positive relationship was uncovered in this sample, namely between the Overall ESG score and a company's inclusion in the Nedbank Green Index. This RI index examines the JSE Top 100 companies based on strict environmental criteria. Two statistically significant differences were observed, namely between those companies included (5.26) and those excluded (4.29) from the JSE SRI Index. The difference observed between companies included and excluded from the JSE SRI Index is in line with literature. As discussed in Section 3.2.9, companies were found to produce better ESG reports when they were included in an RI index, as opposed to companies which were excluded (Collison *et al.*, 2008:19).

The second statistically significant difference observed was between the different industries in which JSE-listed companies operate. Literature had suggested that companies in high-impact industries would publish better ESG reports than companies in other industries, the reason being greater pressure from stakeholders in high-impact companies (Brammer & Pavelin, 2008:123; Antonites & De Villiers, 2003:7). Only one high-impact industry was found to the highest Overall ESG mean score, namely non-cyclical consumer goods companies (5.00). The other two high-impact industries, resources (2.93) and basic industries (3.76), had low mean scores. The two low- and medium-impact industries had the highest Overall ESG mean score, namely cyclical services (6.35) and financials (5.12).

Antonites and De Villiers (2003:2) found that resource companies had better non-financial reporting than companies in other industries, but this is in contrast to the empirical findings. A reason for this result could be high-impact (resource) companies' fear of litigation or liability from what is disclosed in their ESG reports, whereas, companies in low- to medium-impact industries may not have the same concerns as those in high-impact industries. Another reason could be that companies in the lower impact industries find it easier to provide material information in their ESG reports than the high-impact industries (Van Zyl, 2013:919).

7.3.2 Empirical findings from the international Metals and Mining sample

The Overall ESG mean score in the international Metals and Mining sample (n = 173) was classified as low (3.24 out of 10). Here, too, the Governance pillar had the highest mean score (4.20), followed by the Social pillar score (3.08) and the Environmental pillar score (2.65). The differences in the individual pillar scores were also statistically significant.

In this sample two statistically significant relationships were found. The first was between the Overall ESG score and company size. Company size was found in previous studies to be a factor influencing companies' non-financial reporting. The empirical evidence from the Metals and Mining sample is therefore in line with the literature. For this reason large companies had higher ESG scores, whereas small companies had low ESG scores. This is the case generally because larger companies have more resources available to publish better ESG reports than smaller companies do (Brammer & Pavelin, 2008:133; Sonnenberg & Hamann, 2006:313)

The second relationship discovered was between the Overall ESG score and ownership concentration. The greater the ownership concentration in a company, the better the ESG reporting was found to be. Cullen and Christopher (2002:44) suggested that ownership concentration should influence a company's disclosure. However, Roberts (1992:609) found a lack of significant findings to support the theory. In contrast, Cullen and Christopher (2002:52) had found a significant association between ownership and non-financial reporting. Roberts (1992:609) concluded that the reason for the lack of findings could have been owing to the limited measure that was used in the study.

The researcher suggests that the difference in findings and literature could be due to companies in the international Metals and Mining sample having a greater ownership concentration across more institutional investors than in previous studies (Brammer & Pavelin, 2008:121; Cullen & Christopher, 2002:52). In addition, like Roberts' conclusion, the researcher is of the opinion that the present study may have used a measure that was better suited to capturing ownership concentration.

There were a number of statistically significant differences observed in the international Metals and Mining sample. The first difference found was between companies included (6.46) and excluded (3.08) from the FTSE4Good Index Series. This finding is in line with the

literature, and suggested that companies included in RI indices generally publish better non-financial reports than those excluded from such indices (Collison *et al.*, 2008:19).

A statistically significant difference was also detected between companies listed in developed and emerging markets. Companies listed in developed countries (3.62) had better ESG reporting than those listed in emerging markets (2.28). A reason for the differences in reporting could be because emerging market companies generally have more ESG challenges to contend with than their peers in developed countries. For example, in terms of corporate governance, corruption and instability, emerging market companies have greater problems (Transparency International, 2013; Hagart & Knoepfel, 2007:6). The researcher is of the opinion that the numerous environmental and social challenges that companies in emerging markets contend with may prevent them from disclosing this kind of information as they fear litigation and/or negative publicity (Antonites & De Villiers, 2003:2).

The researcher furthermore found a statistically significant difference in ESG reporting of Metals and Mining companies operating in South Africa and other emerging markets. A difference was found between developed and other emerging markets. It was discovered that South African companies had a higher Overall ESG mean score (3.08) than other emerging market companies (1.81). Therefore, South African Metals and Mining companies were observed to have better ESG reports than companies in other emerging markets. This finding could be owing to the legislation and listing requirements by the JSE in South Africa in comparison to the other emerging markets.

Companies which used the GRI guidelines (4.19) in the Metals and Mining sample were discovered to have significantly better ESG reports than companies which did not use the guidelines (2.60). Sonnenberg and Hamann (2006:311) maintained that high-impact companies would be likely to use the guidelines more than companies in other industries.

Lastly, a statistically significant difference was observed between companies which were participants of the UN Global Compact (4.44) and those who were not (2.99). As stated in Section 3.7, UN Global Compact was not previously tested in academic studies and therefore the findings here contribute to the body of knowledge. The researcher earlier mentioned that there were a number of benefits for companies which were participants to the UN Global Compact as it strives to improve companies' ESG reporting (United Nations Global Compact, 2013a). The results therefore support what the UN Global Compact is aiming to do.

7.4 CONCLUSIONS

The researcher concludes from the literature review and empirical findings that ESG reporting is on the increase which provides conventional and RI investors with more non-financial information than before. This increase in ESG reporting will go a long way in enabling investors to make better investment decisions.

There are some challenges with ESG reporting in that ESG considerations are often not reported, and if they are reported it is not done in a standardised manner. These challenges are however, outweighed by the benefits associated with ESG reporting, most notably increased transparency, improved legitimacy of business operations, and better ESG management.

The GRI and the IIRC provide valuable guidelines for companies to improve their ESG reporting. From the findings, adoption of the GRI guidelines and being a participant of the UN Global Compact could demonstrate (to investors and other stakeholders) that a company is conscious of ESG concerns and that it is making an effort to improve its ESG reporting. The findings of this study suggest that it would be beneficial for companies to look at these guidelines, especially those that operate in high-impact industries.

High-impact companies generally have a more distinct impact on the natural environment and society than low-impact companies (Chamber of Mines of South Africa, 2012). From the findings of this study, it seems that investors who want good ESG reporting should steer clear of high-impact industries, such as resources. However, this is somewhat impractical, as this industry forms a large part of many countries' economic situation. These companies should strive to be included in RI indices as investors are increasingly going to look at these indices for guidance, particularly green or sustainability indices such as the Nedbank Green Index, the JSE SRI Index and the FTSE4Good Index Series. Investors who are environmentally conscious would be especially interested in South African companies included in the Nedbank Green Index, seeing that they have been evaluated against strict environmental criteria.

The researcher concludes that metals and mining companies operating in emerging markets still have more to do to improve their ESG reporting. This is particularly true in terms of environmental and social reporting.

From the company size factor investigated, the findings imply that investors and other stakeholders could be more interested in larger companies because of their superior ESG reporting. However, the researcher concludes that the size of a company should not be a defining factor influencing the extent of their ESG reporting. Especially in South Africa where all listed companies, irrespective of their size, are required to produce integrated reports.

In terms of ownership concentration having an influence on the extent of ESG reporting, it can be concluded that the greater the ownership concentration in a company, the better the company's disclosure on ESG considerations. This finding is important to investors and other stakeholders, as they can be assured of comprehensive ESG reports when greater ownership concentration exists in a company.

The empirical results suggest that companies need to pay more attention to each of the three pillars of ESG reporting. Each aspect should be reported on in a manner in which the information can be used by all stakeholders and management itself. The ESG information disclosed should be quantifiable and standardised so that users of the ESG reports could compare different companies reports with one another.

There are also academic implications flowing from this research. Educators in the areas of financial and non-financial reporting could use this study to see which aspects of ESG reporting require more attention and could streamline their education offerings to improve non-financial reporting. Collaboration between companies, initiatives such as the GRI and UN Global Compact, and academics, could all strengthen the drive to increase and improve the extent of ESG reporting, particularly among JSE-listed companies.

7.5 RECOMMENDATIONS

The following recommendations are made based on the findings of this study. The first recommendation pertains to reporting on environmental and social considerations. Management need to ensure that the environmental and social considerations in their company are efficiently monitored and reported on. The environmental and social issues have been identified as more difficult to quantify and therefore disclose, but that does not give companies a justification to neglect them all together.

The next recommendation relates to reporting on governance considerations. The Governance pillar scores for both the JSE (6.06) and the international Metals and Mining (4.20) samples were only average. Therefore, management could consider some aspects for increasing their governance reporting. These aspects are based on MSCI ESG Research's criteria that are used to rate and rank companies, such as (MSCI ESG Research, 2013f:44,122; Marocco, 2010:81):

- Companies should ensure that their reports are audited by a credible third-party.
- As far as possible the board of directors should be independent.
- Compensation for top level management should be considered 'fair' by stakeholders.
- The rights of shareholders should not be infringed upon at any time.
- Companies must be transparent about their conduct and their financial and non-financial reporting.

Governance is the most important consideration to shareholders and other stakeholders. Environmental and social considerations should become just as important as corporate governance is. Even though it is apparent to the researcher that it may be easier for companies to disclose governance information than environmental and social issues, it is essential that the information being reported is material to investors and other stakeholders. According to Hanks and Gardiner (2012:2), a company should collectively, through reporting, communicate the financial and non-financial concerns that are significant to the company and demonstrate how the company "is going to sustain value creation".

Based on the results from the investigation into the industry in which companies operate, the researcher recommends that companies could improve the metrics used to evaluate their ESG performance, especially on environmental and social aspects. By having efficient measurement tools in place, companies should be able to effectively measure and control ESG considerations and be efficiently reported. In addition, from the findings on industry, greater pressure needs to be put on high-impact companies to improve their ESG reporting for the benefits of investors and stakeholders.

The next recommendation relates to the country (emerging market or developed) in which international Metals and Mining companies operate. The researcher suggests that it may be useful for MSCI ESG Research to include more emerging market companies in their sample, for instance Brazil. From the discussion in Section 3.4, companies in emerging markets have been recognised for their improved ESG reporting, particularly when compared to companies

in developed countries. Nevertheless, from the results, companies in developed countries had better Overall ESG scores than companies in emerging markets.

This finding implies that resource companies in emerging markets need to do more to improve their ESG reports. By analysts and investors increasing the attention given to companies in emerging markets, two things could occur. First, the awareness of unique ESG issues that metals and mining companies in emerging markets contend with, may increase. Second, this could lead to improved ESG reporting if these companies are more conscious of their business operations, and action is taken to manage ESG considerations.

For responsible investors who are more discerning when it comes to ESG issues, and who want to diversify their portfolios, emerging market companies are becoming increasingly attractive. Companies should improve their ESG reporting if they wish to attract capital from these investors. For companies in emerging markets to improve their ESG reporting it is recommended that principles or codes to guide ESG reporting should increasingly be developed and implemented, such as in South Africa which has the King III and where JSE-listed companies are required to follow the principles set out in the King III.

With regard to ownership concentration, there were contradicting findings in the literature review (Brammer & Pavelin, 2008; Cullen & Christopher, 2002) and the empirical findings. The researcher recommends that this finding requires further research to determine whether generally ownership concentration is an influencing factor on the extent of ESG reporting or, whether companies in specific industries provide ESG reports which are influenced by the ownership concentration.

A final recommendation is based on the findings relating to company size in the international Metals and Mining sample. The researcher is of the opinion that with the existence of initiatives like the GRI and UN Global Compact, there is no reason why smaller companies should not be able to produce as advanced ESG reports as larger companies. If smaller companies do not try to improve their ESG reports it could lead to an unwanted outcome, because investors would not consider smaller companies in their investment decision-making, seeing that these companies could not be evaluated adequately from ESG reports.

7.6 RECONCILIATION OF THE RESEARCH OBJECTIVES

The primary research objective was addressed through the secondary objectives set out. The first secondary objective was achieved by completing a thorough literature review on the key constructs. The literature review was presented in Chapters Two and Three. The researcher discussed the research design and methodology used in this study in Chapter Four. The second and third secondary objectives were addressed in Chapter Four, where the data collection and analysis process was presented. The last three chapters (Five, Six and Seven) were undertaken to achieve the last secondary research objective, which was to provide pertinent conclusions and recommendations.

7.7 POSSIBLE LIMITATIONS OF THE STUDY

The main limitation of this study was only using one year's worth of data in the research. As stated earlier, the use of only one year's data (2012) was beyond the researcher's control. MSCI ESG Research only completed the first year of ESG research on South African companies when this study commenced. Since the research conducted by MSCI ESG Research is client driven (clients state which companies they are interested in), the number of companies which had been researched was limited. In addition, considering that it is a time-consuming process to calculate the ESG scores, there were no backdated data. As such, the researcher was unable to comment on trends in the data.

7.8 SUGGESTIONS FOR FUTURE RESEARCH

The researcher suggests that this study could be extended to include more years of data. By doing so, researchers could determine if there were any trends in ESG reporting by JSE-listed companies, as well as by international Metals and Mining companies. This holds especially true for when the financial performance measures of a company are investigated.

Based on the findings in Tables 5.11 and 6.12 about the relationships and differences in GRI and UN Global Compact for the JSE and international Metals and Mining sample, qualitative research could be undertaken in the future. In this way, a researcher could gain an in-depth understanding of how companies actually perceive and use these two international reporting guidelines. The findings highlight that greater investigation is required into GRI and UN Global Compact in the South African context.

From the descriptive statistics in Table 6.5 (Section 6.2.2), Metals and Mining companies in emerging markets were found to have better Environmental pillar scores than companies in developed countries. The researcher considered that companies in emerging markets could be turning environmental challenges they face into opportunities (Lubin *et al.*, 2011:14). Emerging market companies are then disclosing their activities in their ESG reports. It could be of interest for future researchers to investigate this result further, to determine if the reason for the higher Environmental pillar score among emerging market companies is related to these companies changing their challenges into opportunities.

7.9 IN CONCLUSION

The researcher has discovered through conducting this study that the concepts of ESG reporting and integrated reporting are becoming widely discussed among academics and practitioners. However, companies need to ensure that they start taking more responsibility and play their part in making ESG reporting not just a theoretical concept, but a practical aspect of their reporting procedure.

ESG reporting as a fundamental part of integrated reporting has the ability, when properly implemented, to improve a company's transparency and allow stakeholders to hold the company accountable for their actions. The management and reporting of ESG considerations are vital aspects that companies can no longer ignore. Investors and other stakeholders are becoming more informed regarding ESG issues that companies face, and therefore are steadily requesting more information from companies.

This study has shown that there are various forms of assistance for companies to strive for higher quality ESG reports. Companies are not alone in this journey to becoming more responsible and looking out for the future of their company, society and the environment around them.

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APPENDIX A

ESG CRITERIA DEFINITIONS

CRITERIA	DEFINITION
ENVIRONMENTAL CRITERIA	
Energy Efficiency	This key issue evaluates the extent to which companies are managing the risk of increased or volatile energy costs across their operations. Companies that take proactive steps to manage and improve the energy efficiency of their operations score higher on this benchmark, while companies highly exposed to energy-intensive business activities and ignoring opportunities to improve energy efficiency or those taking only a compliance-based approach to energy usage score lower.
Water Stress	This key issue evaluates the extent to which companies are at risk of water shortages impacting their ability to operate, losing access to markets due to stakeholder opposition over water use, or being subject to higher water costs. Companies that proactively employ water efficient processes, water recycling and alternative water sources score higher on this key issue, while companies that lack strategies to manage and reduce water use score lower.
Raw Material Sourcing	This key issue evaluates the extent to which companies are exposed to risks of damaging their brand value by sourcing or utilizing raw materials with high environmental impact. Companies that have policies and procedures to source materials with lower environmental impact and participate in initiatives to reduce environmental impact of raw materials production score higher on this key issue. Companies that do not utilize sustainably produced raw materials and set no targets for use of such materials in the future score lower.
Biodiversity and Land Use	This key issue evaluates the extent to which companies risk losing access to market and incurring litigation, liability, or reclamation costs due to operations that damage fragile ecosystems. Companies that have policies and programs designed to protect biodiversity and address community concerns on land use, score well on this benchmark. Companies with operations that disturb large and/or fragile, bio-diverse areas and lack strategies to minimize and mitigate biodiversity losses, score poorly.
Carbon Emissions	This key issue evaluates the extent to which companies face increased costs linked to carbon pricing or regulatory caps. Companies that proactively invest in low-carbon technologies and increase the carbon efficiency of their facilities or products score higher on this key issue. Companies that allow legal compliance to determine product strategy, focus exclusively on activities to influence policy setting, or rely heavily on exploiting differences in regulatory frameworks score lower.
Product Carbon Footprint	This key issue evaluates the extent to which companies are exposed to higher input or production costs for their carbon-intense products due to increased energy costs in a carbon-constrained world. Companies that measure and reduce carbon emissions of their products throughout the value chain and implement programs with their suppliers to reduce carbon footprint score higher on this key issue. Companies that fail to identify or evaluate the carbon footprint of their products or that lack programs to reduce carbon emissions throughout the supply chain and distribution score lower on this key issue.
Toxic Emissions and Waste	This key issue evaluates the extent to which companies are at risk of incurring liabilities associated with pollution, contamination, and the emission of toxic and carcinogenic substances. Companies with strong programs and track record of reducing emissions and waste score higher on this Key Issue, while companies that create large volumes of toxic and carcinogenic emissions or waste, yet lack programs or policies to reduce or control these substances and have experienced recent incidents of contamination score lower.
Packaging Material and Waste	This key issue evaluates the extent to which companies are at risk of losing access to markets or at risk of facing added costs to come into compliance with new regulations related to product packaging content and end-of-life recycling or disposal of packaging materials. Companies that proactively reduce the environmental impact of their packaging, including use of recycled content material and establishment of take-back and recycling programs, score higher on this key issue, while companies that have done little to address packaging impacts or have implemented a packaging strategy that is strictly compliance-driven score lower.
Electronic Waste	This key issue evaluates the extent to which companies that produces or sells electronic products face risks associated with recycling and/or disposal of end-of-life electronic products. Companies that proactively address electronic waste concerns by establishing comprehensive and well-managed product recovery and recycling programs score higher on this benchmark, while companies with a strictly compliance-driven approach score lower.
Insuring Climate Change Risk	This key issue evaluates insurance companies' exposure to risks to insured assets or individuals associated with the effects of climate change. Companies that have integrated climate change effects into their actuarial models while developing products to help customers manage climate change related risks score higher on this issue, while companies that are highly exposed to climate change but do not consider it to pose a business risk score

	lowest.
Financing Environmental Impact	This key issue evaluates the extent to which companies are at risk of credit defaults resulting from poor due diligence processes related to environmental concerns. Companies that proactively address the environmental risks embedded in their financing decisions score higher on this key issue, while companies that have not articulated a strategy for managing indirect environmental risks score lower.
Opportunities in Clean Technology	This key issue evaluates the extent to which companies are taking advantages of opportunities in the market for environmental technologies. Companies that proactively invest in product and services addressing issues of resource conservation and climate change score higher on this key issue. Companies lacking strategies and investments targeting these areas score lower on this key issue.
Opportunities in Green Building	This key issue evaluates the extent to which companies are taking advantage of opportunities to develop or refurbish buildings with green building characteristics including lower embodied energy, recycled materials, lower energy and water use, waste reduction, and healthier and more productive working environments. Companies that proactively develop or refurbish buildings to achieve green building certifications score higher on this key issue, while companies that ignore opportunities in green buildings score lower.
Opportunities in Renewable Energy	This key issue evaluates the extent to which companies are taking advantages of financial opportunities linked to the development of renewable power production. Companies that proactively invest in renewable power generation and related services score higher on this key issue, while companies lacking any strategic interest in the field score lower.
SOCIAL CRITERIA	
Labour management	This key issue evaluates the extent to which companies are at risk of workflow disruptions due to labor unrest or reduced productivity due to poor job satisfaction. Companies that provide strong employment benefits and performance incentives and offer employee engagement and professional development programs score higher on this key issue. Companies that face high risk of labor unrest due to recent layoffs or operations in markets with high propensity to work stoppages and do not offer strong employment benefits and employee engagement programs score lower on this benchmark.
Supply chain labour standards	This key issue evaluates the extent to which companies are exposed to risks of production disruptions and brand value damage due to sub-standard treatment of workers in the company's supply chain. Companies that establish labor management policies meeting stringent international norms, implement programs to verify compliance with the policies, and introduce incentives for compliance among suppliers score higher on this key issue. Companies that lack a comprehensive policy and compliance monitoring systems, to identify and address possible violations of labor standards score lower on this key issue.
Health and safety	This key issue evaluates the extent to which companies are at risk of H&S accidents that can lead to production disruptions, litigation, and liabilities. Companies with comprehensive H&S management and superior track record operating in countries with lower level of industrial fatalities score higher on this key issue, while companies with poor strategy and track record score lower.
Human capital development	This key issue evaluates companies' ability to attract, retain, and develop human capital based on their provision of benefits, training and development programs, and employee engagement. Companies that proactively manage human capital development through offering competitive benefit packages, implementing formalized training programs, and actively measuring employee satisfaction score highest on this key issue. The companies that rely heavily on highly-skilled employees but show no evidence of such employee engagement score poorly on this key issue
Product safety and quality	This key issue evaluates the extent to which companies are at risk of facing major product recalls or losing customer trust through major product quality concerns. Companies that proactively manage product quality by achieving certification to widely acceptable standards, undertaking extensive product testing and building processes to track raw materials or components score higher on this Key Issue. Companies that take a reactive approach to managing recalls and product quality concerns score lower.
Chemical safety	This key issue evaluates the extent to which companies are at risk of losing access to markets or at risk of facing costs related to reformulating their products due to the presence of chemicals of concern. Companies that proactively eliminate chemicals of concern from their products ahead of regulatory changes score higher on this key issue, while companies that allow legal compliance to determine product strategy score lower.
Financial product safety	This key issue evaluates the extent to which companies could incur costs associated with unanticipated credit losses, litigation, and regulatory changes through offering financial products that lack transparency or are highly likely to be financially unsustainable to the

	end-user. Companies that offer transparent financial products based on a borrower's ability to repay score higher on this key issue. Companies that are highly exposed to over-leveraged borrowers and rely on offering controversial products to generate growth score lower.
<i>Privacy and data security</i>	This key issue evaluates the extent to which companies are at risk of incurring reputational damage from a data security breach or controversial use of personal data, or having their business model undermined by evolving regulatory requirements on privacy and data protection. Companies with comprehensive privacy policies and data security management systems and companies that do not have business models reliant on trafficking in personal data score well on this key issue. Companies offering few or no assurances regarding the protection of personal data score lower, as do those with business models that rely on trafficking in personal data without consent.
<i>Insuring health & demographic risk</i>	This key issue evaluates companies' exposure to emerging insurance risks associated with public health trends and demographic change. Companies that have systems in place to identify and model emerging risks associated with health and demographic changes score higher on this key issue, while companies that do not acknowledge emerging risks score lower.
<i>Controversial sourcing</i>	This key issue evaluates the extent to which companies are at risk of incurring regulatory compliance costs, reputational damage, or supply chain disruptions resulting from reliance on raw materials that originate in areas associated with severe human rights and labor rights abuses. The range of scoring depends on the material, with different materials relevant for different industries. In general, companies able to trace the origin of their raw materials and certify that they were obtained in a way that minimizes social harm (e.g. slave labor, funding for groups engaged in human rights violations) score higher on this key issue, while companies that do not work with their suppliers and use no certified materials score lower on this key issue.
<i>Opportunities in nutrition and health</i>	This key issue evaluates the extent to which companies taking advantage of the growth opportunities in the market for healthier products. Companies that offer products with an improved nutritional or healthier profile and have sought credible verification for its healthier status score higher on this key issue, while companies that do not offer such products to respond to new consumer demand in this area score lower on this key issue.
<i>Access to communication</i>	This key issue evaluates the extent to which companies are taking advantage of opportunities for growth in historically underserved markets, including developing countries and underserved populations in developed countries (such as rural areas and the elderly). Companies with considerable operations in developing countries score well on this key issue, as do those with substantial activities focused on expanding access through relevant initiatives and philanthropic efforts. Companies focused mainly on developed countries and well-served populations score lower.
<i>Access to health care</i>	This key issue evaluates the extent to which companies are taking advantage of opportunities for longer term growth and protecting license to operate through efforts to improve access to healthcare in developing countries and for under-served populations in developed markets. In developing countries, companies that adapt their business models to reflect the specific needs of individuals in these markets through areas such as R&D, pricing, and licensing strategies will score higher on this benchmark than companies with less developed access programs. In developed markets, companies that take advantage of opportunities driven by regulatory changes to capture the uninsured market will score higher on this benchmark than companies with few or no plans to address differences across the market in healthcare access.
<i>Access to finance</i>	This key issue evaluates the extent to which a company is taking advantage of opportunities for growth and strengthening reputation through providing lending, financing, or products to underrepresented or underbanked communities. Top performing companies will offer products and services to communities with limited or no access to financial products, where weak performers limit their product offerings to more saturated financial markets.
<i>Responsible investment</i>	This key issue evaluates the extent to which companies' investment portfolios are exposed to ESG-related risks. Companies that mitigate ESG risks in their investments by integrating ESG risk analysis into their due diligence process across all investment portfolios and asset classes score higher on this key issue. Companies that are more exposed to potential ESG event risk and lack efforts to conduct ESG due diligence score poorly on this key issue.
GOVERNANCE CRITERIA	
<i>Corruption and instability</i>	This key issue evaluates the extent to which companies are at risk of suffering operational disruptions or loss of market access due to violence, property destruction or sabotage, political instability, demands for bribes, and costly litigation related to corrupt practices.

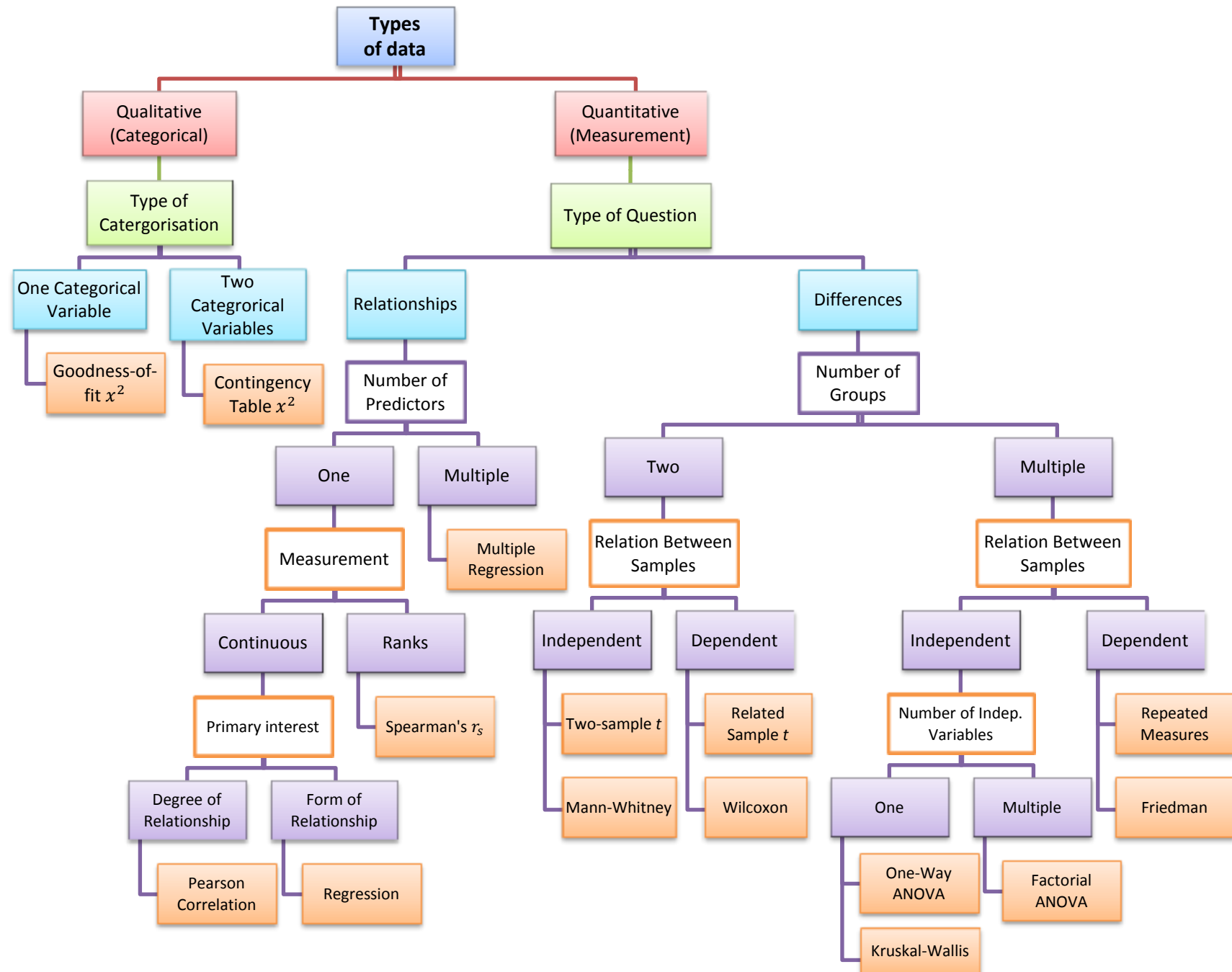
	Companies that have programs, guidelines, and clear policies to avoid corrupt business dealings, have strong partnerships with local communities, and have high level of disclosure and transparency score higher on this key issue. Companies with a history of community opposition, those facing security problems and lacking transparency in ESG and financial information score lower on this key issue.
<i>Financial system instability</i>	This key issue evaluates the extent to which a company contributes to systemic risk in financial markets. Companies that institute strong governance structures, demonstrate a high level of transparency, and avoid large scale controversy score well on this key issue. Companies that are large and deeply interconnected to other financial institutions but have limited checks and balances in their governance structures and have incentives for short-term risk-taking at the expense of long-term economic value creation score poorly on this key issue.
<i>Business ethics fraud</i>	This key issue evaluates the extent to which companies face regulatory and legal risks or loss of investor confidence due to ethics issues that include but are not limited to accounting fraud, pricing fraud, criminal behavior among top executives, controversial customer practices, and insider trading. Companies that have avoided controversies in these areas score higher on this key issue, while companies that have faced moderate or severe controversies over the past three years score lower.
<i>Anti-competitive practices</i>	This key issue evaluates the extent to which companies face regulatory risks relating to anti-competitive practices. Companies that have avoided controversies in this area score higher on this key issue, while companies that have faced moderate or severe controversies over the past three years score lower.
<i>Corporate governance</i>	This key issue evaluates the extent to which companies' corporate governance practices in specific governance areas – audit, board, compensation/remuneration, shareholder rights – pose financial risks to shareholders.

Source: MSCI ESG Research (2013f:57-122)

APPENDIX B

DECISION TREE FOR STATISTICAL TESTS

Source: Howell (1999:416)



APPENDIX C

STATISTICAL TECHNIQUES BASED ON MEASUREMENT LEVEL AND TESTING SITUATION

Measurement Scale	One-Sample Case	Two-Samples Test		<i>k (more than two)-Samples Tests</i>	
		Related Samples	Independent Samples	Related Samples	Independent Samples
Nominal	<ul style="list-style-type: none"> • Binomial • Chi-square (χ^2) one-sample test 	<ul style="list-style-type: none"> • McNemar 	<ul style="list-style-type: none"> • Fisher exact test • χ^2 two-samples test 	<ul style="list-style-type: none"> • Cochran Q 	<ul style="list-style-type: none"> • χ^2 k-samples
Ordinal	<ul style="list-style-type: none"> • Kolmogorov–Smirnov one-sample test • Runs test 	<ul style="list-style-type: none"> • Sign test • Wilcoxon matched-pair test 	<ul style="list-style-type: none"> • Median test • Mann–Whitney U • Kolmogorov–Smirnov • Wald-Wolfowitz 	<ul style="list-style-type: none"> • Friedman two-way ANOVA 	<ul style="list-style-type: none"> • Median extension • Kruskal–Wallis one-way ANOVA
Interval and Ratio	<ul style="list-style-type: none"> • t-test • Z test 	<ul style="list-style-type: none"> • t-test for paired samples 	<ul style="list-style-type: none"> • t-test • Z test 	<ul style="list-style-type: none"> • Repeated-measures ANOVA 	<ul style="list-style-type: none"> • One-way ANOVA • n-way ANOVA

Source: (Cooper & Schindler, 2011:467)